# FYP DISSERTATION

*by* Siva kumaaran Arumugam


| | | | |
|---|---|---|---|
| FILE | FYP1.DOCX (3.73M) | | |
| TIME SUBMITTED | 29-JUL-2015 10:46AM | WORD COUNT | 11025 |
| SUBMISSION ID | 558301062 | CHARACTER COUNT | 61590 |

# Student-Parent Communication System

by

Siva Kumaaran S/O Arumugam

18167

Interim report submitted in partial fulfilment of the requirement

for the Bachelor of Technology (Hons)

(Business Information System)

JANUARY 2015

Universiti Teknologi PETRONAS
Bandar Seri Iskandar
31750 Tronoh
Perak Darul Ridzuan

CERTIFICATION OF APPROVAL

**FYP 1 Interim Report**

By

Siva Kumaaran S/O Arumugam

18167

FYP 1 Interim Report submitted to the

Business Information System Programme

Universiti Teknologi PETRONAS

In partial fulfilment of the requirements for the

BACHELOR OF TECHNOLOGY (Hons)

(BUSINESS INFORMATION SYSTEM)

Approved by,

_____

(Dr. Aliza Sarlan)

UNIVERSITI TEKNOLOGI PETRONAS

TRONOH,

PERAK

May 2015

## CERTIFICATION OF ORIGINALITY

This is to certify that I am responsible for the work submitted in this project, that the original work is my own except as specified in the references and acknowledgements, and that the original work contained herein have not been undertaken or done by unspecified sources or persons.

_____

SIVA KUMAARAN S/O ARUMUGAM

## Abstract

This FYP 1 Interim Report described about Student Parent Communication System hardware prototype that in charge in helping the school kids to communicate with the parents at home or office. By Overall, SPCS is a helpful communication device that is built according the latest technology and generation Y parent's preference. The system adopted the system of Global System for Mobile Communication (GSM) and Short Messaging Service (SMS). The system was designed to call and send an alert SMS to the parents/guardians whenever the kids uses the system. Likewise, kids can receive call and alert SMS from the parents. In this case, SPCS hardware prototype can allow the parents and kids share important news and stories through this new system by not obeying school rules. All the text messages used a predefined content of 160 characters or less, without graphics and are local texting only. Results obtained from the survey by asking 50 respondents about implementation of SPCS hardware Prototype. Most of them supported and given positive feedback for this project. For Instance, when the question of will Student Parent Communication System will be useful for the kids and parents, 96% parents said yes and only 4% said no for this prototype. This Student Parent Communication System hardware prototype is really convenient, economical and reliable method of communication between parents and kids since it does not require any identification id to enter into the system. Thus, this latest invention could be used by all level of kids depending on their needs.

# CHAPTER 1

# INTRODUCTION

## 1.1 Background of study

Nowadays, there is abundance of mobile phones to make parents at home or office to communicate with their children's in the school. As seen these days, some of the products will be available for use such as to message and for calling purpose. No matter in what type mobile phones are available, the aim of any device is to help parent's to communicate with their children's at school. But, the fact is based on Malaysian Education ministry (Kementerian Pelajaran Malaysia), school students strictly not allowed to bring mobile phones to school because it is against the law. Until now, there is 2 % of invention that specialize in devices only for communication purpose between the parents and children while being in the school but the inventions is not usable for a long term purpose. This is due to several reasons including the courseware being non user-friendly, not meeting the full specifications of the frequency range and not feasible to be used. According to (Chipangura, Terzoli, Muyingi, & Rao, 2006), the wireless technology is the most interesting technology in the ICT industry today, where there is much innovation and research. As technology developed through time, advances in telecommunication and computer hardware knowledge have led to the emergence of mobile computing.

Research in Software engineering (SE) has proposed many techniques for ensuring user-friendliness of a mobile application and electronic devices such as Android wear, Parent Alert System apps and Amber Alert. But, this kind of techniques still producing poor results when it is applied on any situations that involves communication purpose between parents and children. Besides that, the type of mobile apps and electronic communication device needed to cater the needs and wants of parents and children. As a solution, this project will develop a Mobile application for the parents usage that Is called as Student Parent Communication system mobile application (SPCS) and an electronic communication device for the children in the school which provides a great

communication platform whereby this both technology can ease the communication between parents at office or home with their children in the school. By performing this kind of projects, we hypothesize that the Easier the electronic communication device to transmit signal, the more faster notification alert will be received by the parents to allow them to know the updates from their children in the school.

Feasibility, adaptability and user-friendliness will be defined by different people. Student Parent Communication system project is seriously feasible to be used by everyone because the function in both mobile application and electronic communication device is seriously easy to be understood. Furthermore, it is really an adaptable product because it can be brought anywhere that we want and the mobile application can be downloaded. As for user-friendliness, certainly it is true that our product is easy to be used and don't need to undergo very tough procedure to operate it.

**1.2 Problem statement**

Based on the background study above, the current product invention (Easy Communication system) for the parents and children can be improved wisely. Therefore, given below few problem statements that is identified throughout my research:

There is a problem of difficulties of communication between parents and children. Despite the project prototypes according to some software engineering technique, the problem of having difficulties in communicating each other between parents at home or office and children at school. This has been reported by many researchers such as (Ahmed,2009) and (Pankaj and Bhatia,2013) during their assessments. (Ahmed,2009) have mentioned a good parent alert system have made presence of violence within school premises would adverse effect the educational process and operations of the institutions, students, academic performance, and the loss of trust and confidence of parents. This problem has merely affected school student routine line because this will contribute unhappiness and discouragement using the products. Besides, this problem occurs because lack of knowledge on how to use the product according the children's and parent is in. Hence, a research should be done to investigate more detail the concept

and procedures used in the products that could tally the situation. There is three concentrated problems been identified that drives towards the emergence of this project:

- Communication problems between parents and children
- Restriction of Malaysian education law
- Students cannot reach their parents at the vital moment

## 1.3 Aim and Objectives

The aim of this project is to develop two types of prototypes for both parents and their children which both of the product will help in communication purpose between parents at home or office and children in the school. The Mobile application serves accordingly for the parents to download the application from the Google application store and the electronic device will be targeted towards the children. This project is seriously feasible and having its economic value to be marketed because this prototypes will be helping in children and parents routine life. In order to fulfil the aim the following objectives will need to be met:

- To develop easy communication system(Prototype) by using the existing software and android platform.
- To investigate the methods can be used throughout the development of this product
- To evaluate the acceptance of user/acceptance on the developed mobile application.
- To provide the realistic prototypes as planned that is the ECS electronic device (GSM, SMS) that will be used by the children in the school and to build a ECS mobile application to notify the parents the presence of the children. Hence, to know the routine activities of the children in the school.
- To complete the Student Parent communication system prototypes by the given time duration.

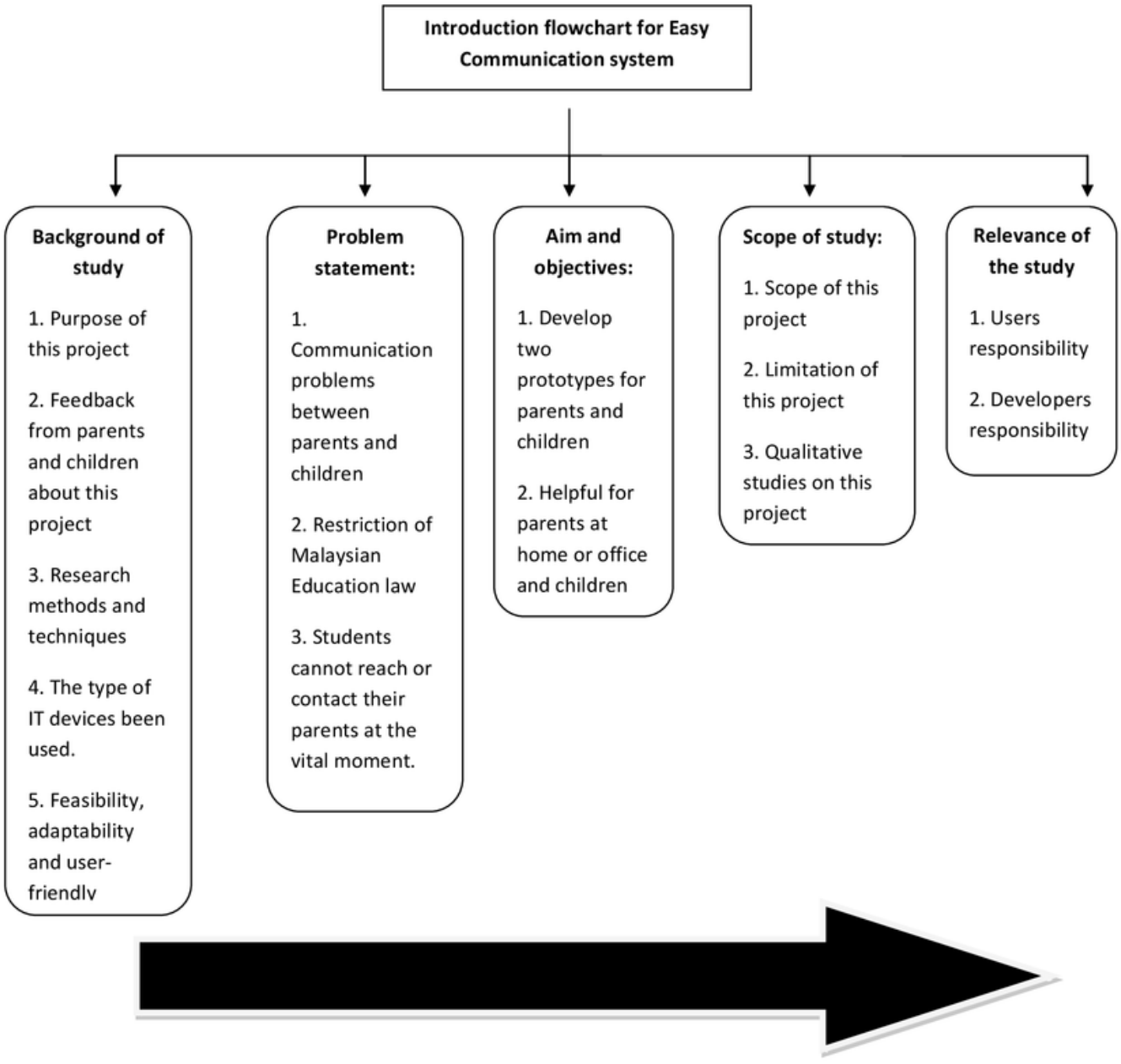
### 1.4 Scope of study:

The study was limited to an investigation of the development of my project on Student Parent communication system. This study explored the Student Parent communication system prototype as one instance of information technology development. The research that I have done on this project provides a richness of data and can lead to a deep understanding of a phenomenon in a single context. In the development phase of this project there is two prototypes need to be developed. The methods used to develop this prototypes including, procedures, technique, best practice, entity and pattern. This Student Parent communication system project is the best to be practiced and vast benefits will be gained by the parents at home or office and their children's in the school. Besides that, in every good project there must be detection period whereby to capture, identify and highlight the problems faced by the Student Parent communication system project. In every project there must be preliminary studies same goes here, i have decided to conduct a qualitative research by doing a survey by providing questionnaire to the school childrens and parents for them to evaluate and give feedbacks on my project idea.

Student Parent communication system project development included a range of activities, entities,processes,forces and contexts including:

- Initiation of developments efforts.
- Components and stages developments of this standard.
- Forces and pressures that affected the development of the standard(economic and technology).
- Stakeholders and other interested parties and their interaction.

## 1.5 Flowchart Of Introduction Research Proses



### 1.6 Relevance Of Study

There are two main stakeholders have been identified for this easy communication system project that is product user and developers.The recognized users are parents and the children in the school. The proposed study serve the user on the information obtain in the application and another electronic device.Not only act as a communication provider to let parents and children to communicate while the children in the school but also act as an interactive application through the mobile application for the parents to check into availability of their children in the school. For the developers part, we as the developers paying the full effort to come out with the best prototypes to make it reliable to be used by the parents and the children.

# CHAPTER 2

## LITERATURE REVIEW

### 2.1 Understanding The GSM and SMS

It is vital to understand the working mechanism of Global system for mobile (GSM) and Short messaging service (SMS) together as this innovation have been attempted to communicate with parent's mobile phones. It is important to understand the working mechanism of GPS as this innovation have been attempted to operate based on Global Positioning System (GPS). (Ihmed, 2009) stated that the wireless technology is the most interesting technology in the ICT industry today. Alert system has widely used many arias and types. The most one is using SMS to alert people or users and notify them about specific action. This system has GPS which will receive the coordinates from the satellites among other critical information. Tracking system is very important in this modern world. This can be useful in soldier monitoring, tracking of the theft vehicle and various other applications. The system is microcontroller based that consists of a GPS and global system for mobile communication (GSM). This project uses only one GPS device and a two way communication process is achieved using a GSM modem. A GSM modem, provided with a sim card uses the same communication process as we are using in regular phones.(Verma and Bhatia, 2013).

GSM connectivity is the most vital ever backbone for every mobile phone should have because through GSM connectivity all the network is interconnected.GSM network is a cellular network. Cellular networks are radio networks that consist of cells. There will be two important most transceivers for the GSM network that is transmitter and receiver that will be incharge of receiving calls and making a call through the network. The GSM network refers to these towers as base stations (BTS). The size of each cell refers to the area that is designed for. There will be five various sizes that is been used in GSM mobile phone system.SMS stands for short message service that is a mechanism of

delivery of short messages over the mobile networks. Besides, it is a storage center and forward way of transmitting messages to and from mobiles. In addition, the message from the sending mobile is stored in a central short message center (SMS) which then transfer it to next destination through mobile. This means that in that case of the recipient is not available; the short message is stored and can be sent later. GPS is a system whereby it is famously being used for many purpose mainly used to track location and detect availability of theft and etc. How it works? This question may strike your mind sometimes, the satellites transmit the exact time the signals are sent. By subtracting the time the signal was transmitted from the time it was received and gathered, By the way, GPS can tell how far it is from each satellite. Besides, the GPS receiver also knows the correct position in the sky of the satellites, at the moment they sent their signals. Besides that, for the few innovations that is similar with ECS kid's prototype, the software programming being the backbone for every project told by two researchers. The software programming is done in 'C' language. Data (co-ordinates) received by GPS from the satellites defined in the software. The mobile number of the user should be included in the software programming in order to receive the location values from the SIM card which we are using in GSM modem (Verma and Bhatia, 2013).

## 2.2 Hardware Device for School Kids By Having Combination Of GSM and SMS

In the development of this project for the school kids to make them to communicate with the parents first raised by some researchers. The utilization of mobile devices for teaching and learning tool is known as mobile learning or mlearning. Among several mobile technologies being used for learning, SMS appeared to be the most ubiquitous and stable one, which makes it a great potential in education. SMS messaging was also found to be the most useful and convenient way of communication technology (Ismail and Azizan, 2012).In this case, it is clearly stated the usage of SMS is been encouraged by few researches in the daily usage for students use. So, by enhancing my FYP project on Easy communication system to be more appropriate by building few templates on my ECS hardware prototype. In many almost similar innovation with ECS kids system

.

(Indico, Lanciso, Vargas, 2014) stated that an application software have been designed that would combine monitoring and alert system of pupils coming in and out of the school campus through biometric fingerprint scanning and text messaging(SMS) sent to students parents or guardians. This shows that both parents are seriously concerned about the safety and security of their kids in the school.

However, this innovation has its own limitation as the parents need to have GSM phone or smart phones to establish connection with this kids SPCS device. In this case, if there is any emergency, reset button is provided on the prototype together with calling and call receiving button for the kids to communicate with their parents. Ultimately, this prototype can work in almost all the places same as other GSM communicating devices as long as the prototype is brought around of the Radio base station to give strong coverage for the prototype to make calls and send instant messages to their parents.

### 2.3 Independent Outdoor Mobility

The innovation do not really lead the user for installing any system instead it makes the user to practice very easy life by jus using two medium only that is the ECS kids prototype and GSM phone or smart phones. The main objective of this research mainly to make the kids in the school to communicate with the parents at home or office and to avoid any discomfort among the parents that are so worried of their kids safety and security. This mainly eliminate the usage of smart phones among some kids in the school using it in a very irresponsible way by playing games and surfing the internet and this also will boost up the primary school rules to be more particular and will encourage the usage of this ECS kids device.

### 2.4 The Retaliation Of Mobile Technology Towards The Parents

Cell phone belongs to privacy equipment in Chinese culture. It deposits user's much information and such information should belong to personal privacy. Parents are the guardian of their children and they have th esponsibility of monitoring the growth of children. However, they should not probe into the children's privacy without the prior

consent of their allowances. Otherwise, it will trigger the children's psychology resistance. It seems that parents give the children power but to impose intervention at the same time. Consequently, the children may be form of a revenge effect, which fails to improve the relationship but builds up confrontation between parent and child. And it will cut off communication in family. (Yang, Li, Wang, Yushun, Huang, 2010). Security support is mandatory for any database system. For mobile database systems, security support is even more important to protect the users and devices as well as the database. In mobile communication, since wireless medium is available to all, the attackers can easily access the network and the database becomes more vulnerable for the user and the data in the mobile device. ( Sujithra, Padmavathi, 2012). (Borneo Post Online, 2013) stated that The Malaysian mobile phone Owners Association is not in favour of allowing students to use mobile phones in schools because it has more negative than positive effects.

## 2.5 Parental Involvement And Technology Responsibility

Parental involvement as defined by Kohl, Lengua and McMahon (2000) encompasses three areas: direct contact with teachers, parental action at school, and parental actions at home. Communication between teachers and school fosters parental involvement that has been shown to increase academic success (Epstein, 2005), as well as improve student behaviour (Constantine, 2003; Hoover-Dempsey, Walker, Sandler, Whetsel, Green, Wilkins & Closson, 2005). Technology has been shown to increase the means by which the parents communicate (Davenport & Eib, 2004;Furger 2006). Innovative technologies such as cell phones, e-mail, and websites provide schools with new tools for reaching middle school parents and keeping them informed about them informed about their children. Besides, survey items regarding parental involvement were developed around Epstein's (2005) six types of parental involvement in order to obtain information on how technology was being used to facilitate parental involvement. Furger (2006) called for schools to enhance parental involvement through communication by providing teacher with E-mail addresses, developing or enhancing school websites, delivering school newsletter electronically, and allowing parent's access to student data online.

## 2.6 Parents Urgent Demand For Parent Adolescent Communication

The process of the interview demonstrates that the fact paced lifestyle reduces the communication of family members. Teenagers are a crucial stage of growth, so it would be of great help for character development if they are willing to and also good at communicating with family members. Therefore, Parents need communication with their children urgently. They hope to make use of leisure and trivial time to communicate with their children.(Yang, Li, Wang, Yushun, Huang,2010).

## 2.7 Previous Work By Former Researchers

Ahmed (2009) stated that the Parent Alert System (PAS) prototype is introduced to be used by the teachers in high schools. Charging scheme for SMS is out of the study scope. The system covers two main functionalities. First function is to get the attendance information of the students and second on is to send SMS to the parents if their son/daughter is absent to alert them. The General Methodology of Design Research is adopted to achieve the research objectives. This research project described a mobile monitoring and inquiry system using the fingerprint biometrics and short message service (SMS) technology. It was specifically developed for the *monitoring of preschoolers attendance* during their schooling, which is beneficial to the working parents. The system adopted the rational unified process (RUP), visual c#.Net 2008 and MySQL server 5.1 database and software development kit (SDK). The system was designed to automatically sends an alert SMS to the parents/guardians whenever the pupils logged-in/logged-out in the system. Likewise, it could receive an SMS inquiry and sent an SMS reply to the parents/guardians when no alert message was received after the expected after the expected time of logged-in/logged-out of the pupil. All the text messages used a predefined content of 160 characters or less, without graphics and local texting only. (Indico, Lanciso, Vargas, 2014).

Besides that, the new communication technique, which the researchers call "Ambient backscatter," takes advantage of the television and cellular transmission that already surround us around the clock. Two devices communicate with each other by reflecting the existing signals to exchange information. The researchers built small, battery-free

devices with antennas that can detect, harness and reflect a TV signal, which then is picked up by other similar devices. The technology could enable a network of devices and sensors to communicate with no power source or human attention needed. (Gollakota, 2013). According to Indico, Lancinso, Varegas, 2014. The mobile monitoring and inquiry system using the fingerprint biometrics and SMS technology is convenient, economical and reliable method of monitoring, identifying users since it has no longer requires identity cards or passwords memorization. Thus, the system could be used by other levels of pupils depending on their monitoring needs, however, there is a need for some innovation like designing a multiple detection and recognition using a high resolution of camera for easy use of login and logout in the system.

(Vockley, 2013) stated that the vast majority of children at all grade levels, pre-school through 12th grade have access to an array of technology at home, including mobile devices and computers. But the number and type of devices owned differs depending on student's grade level and household income and type of devices owned differs depending on student's grade level and household income. Seventy seven percent of families have at least on smart phone, and almost half (46 percent) have at least one tablet. Many children are using many different devices and using them often. Even some pre-K children are using multiple devices. Smart phones are the most commonly used mobile device, 43 percent of all children (pre-K-12), and 60 percent of high school students, use a smart phones. One is in three children (34 percent) use tablets. Children use most devices daily of weekly, with smart phones the most commonly and frequently used device. Older students (grade 9-12) are more likely to use portable computers, smart phones and MP3 players, younger students (K-2) are more likely to use portable computers, smart phones and MP3 players, younger students (K-2) are more likely to use portable computers, smart phones and MP3 players, younger students (K-2) are more likely to use tablets. Girls are more likely than boys to use many types of mobile devices. Girls are more likely to use mobile devices in general (75 percent of girls reportedly use mobile Vs 67 percent of boys). Many children's are most likely to use specific devices, including tablets (39 percent Vs 30 percent) and e-readers (16 percent Vs 7 percent). (Fernando, Peiris, 2009) stated that Huggy Pajama focuses on developing a mobile hug communication system for parent and child, and provides a realistic soft

touch sensation. It enables user to hug or touch different areas on the hug sensing interface, and map this to actuate different parts of the haptic pajama

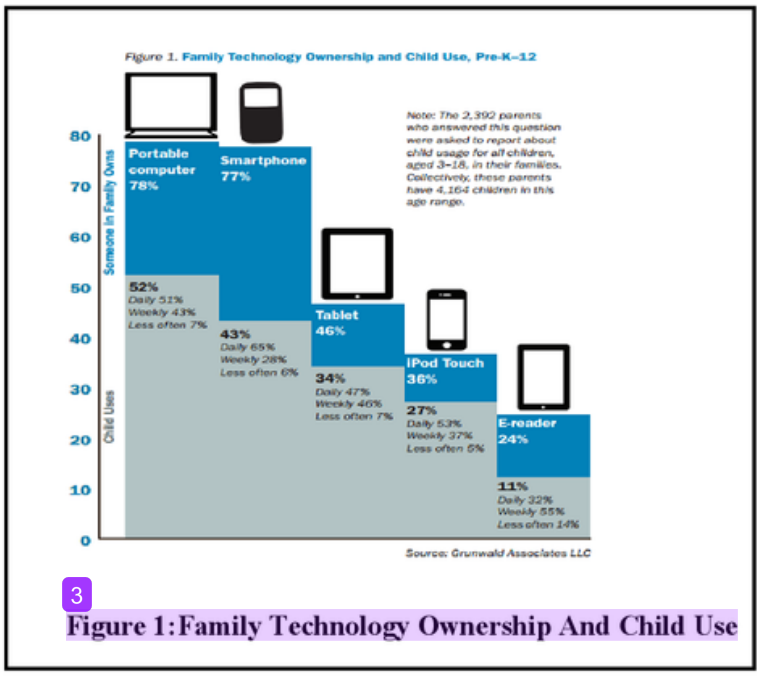



**Figure 1:Family Technology Ownership And Child Use**

(Bailey, Stoner, Pareete, Jr, Angell, 2006) stated that increased student communicative competence was demonstrated through students use of the ***AAC devices*** and systems in functional communication exchanges with multiple communication partners. Several AAC team members suggested that a first step to increased communicative competence with AAC begins with demonstration of value of ownership had the effect or ownership of the device. Most of the members expressed that AAC user's ownership had the effect of increasing AAC user's interest in expanding use of AAC devices with a greater number of peers and members of the community at large. Increases in device use with a variety of communication partners was indicated as reciprocal in device use with a variety of communication partners was indicated as reciprocal to increased competence with AAC device use. Often, AAC users demonstrated device ownership by initiating their own message changes on their devices according to changes in communication partners. Three major categories emerged as primary barriers of AAC device use.

These categories included time constraints, AAC device specific limitations, and incongruence with parents. Team members suggested that time constraints limited optimal AAC device use. Responses involving time constraints were primarily divided into two distinct areas: time for collaboration and time for programming AAC devices.

## 2.8 The Parts And Tools Been Used By Other Researchers

Yousif Ahmed, Zeinab Abd Alrahman, Razan Saad Aldeen, Elham Altyeib and Khansaa Taha (2013), stated that The DigitaPersona was used as fingerprint reader to capture the fingerprint image of the pupils when performing the login and logout in the system. The Microsoft visual C# Net 2008 was used to develop the system and the software Development Kit (SDK) called *DigitaPersona one Touch For Windows SDK 1.4.0.1* was used for registration and recognition of the fingerprint images. Additional tools for the software development kit (SDK) were used such as fingerprint reader, webcam and GSM modem.

## 2.9 Reflection on my SPCS prototype project

There are many theoretical, practical and understanding approach and research that has been done before that really helps in my research findings on my project that is Student Parent Communication System prototype. There are some highlighted comparison can be made between my project and previous researchers project. (Bailey, Stoner, Pareete, Jr, Angell, 2006) stated that AAC device become an important and pressing issue for education professionals who serve children with disabilities and their families. Therefore, SPCS hardware prototype concentrated only for primary school kids having difficulties in contacting their parents. According to Ihmed, 2009. First function of Parent Alert System is to get the attendance information of the students and the second will be to send SMS to the parents if their son/daughter is absent to alert them. (Indico, Lanciso, Vargas, 2014) stated that mobile monitoring and inquiry system device will provide accurate identification of users, track and audit records of users. This system would also provide accurate user identification, monitoring, SMS alert and inquiry which could be used by the school administrators and the parents of the kids. The system made use of wireless networks, mobile phone, Global System for Mobile

Communication (GSM) modem and biometric device. In this case, SPCS prototype differs with mobile monitoring and inquiry system with only function that is monitoring the kid's activities. SPCS prototype function as a communication prototype that is equipped with SMS and GSM to communicate with the parents only but don't have the specification to monitor the kid's activities.

Student Parent Communication System prototype will not only satisfy the users that is the kids and the parents but beyond than that by giving high level of security and safety for the kids in the school. So, parents will be not so worried of their children's security. By overall research, SPCS hardware prototype is one of the first prototype that act as communication device for kids to communicate with parents at home or office going to be implemented in Malaysia and has the high capability of commercializing and marketing the prototype by targeting parents that has school kids. Throughout my research about communication device that existed in this world, i have indulged with a lot of inventions few researchers from other countries.

Initially, I noticed that there will be 3 main context in reflection study that is Reflection on action (Self Reflection), Performance, Reflection for action (Forethought). For Self Reflection, I have done research in communication device that has been used by parents and kids to tally with my SPCS hardware prototype project. By the way, In order to get the correct valid data and information, I decided to go for some primary schools within Malaysia to get feedback from the teachers and parents about my Final Year Project initiative. By God grace the feedback from them was very good and SPCS prototype is being one of the necessity device for all the parents in Malaysia. Hence, for reflection for action there will be two types that is performance and forethought. SPCS hardware prototype still in development phase, so there is no valid data to verify its performance level. On the other hand, forethought knowledge should be adapted to enhance the technology that been emphasized in SPCS prototype for its feasibility and functional level and this future recommendation part will be illustrated in the conclusion part

# CHAPTER 3

## METHODOLOGY

In conducting this project, various processes need to be done in order to come up with complete Easy Communication System hardware prototype. Figure 3.1 shows the major involved long with the methods and deliverables used:

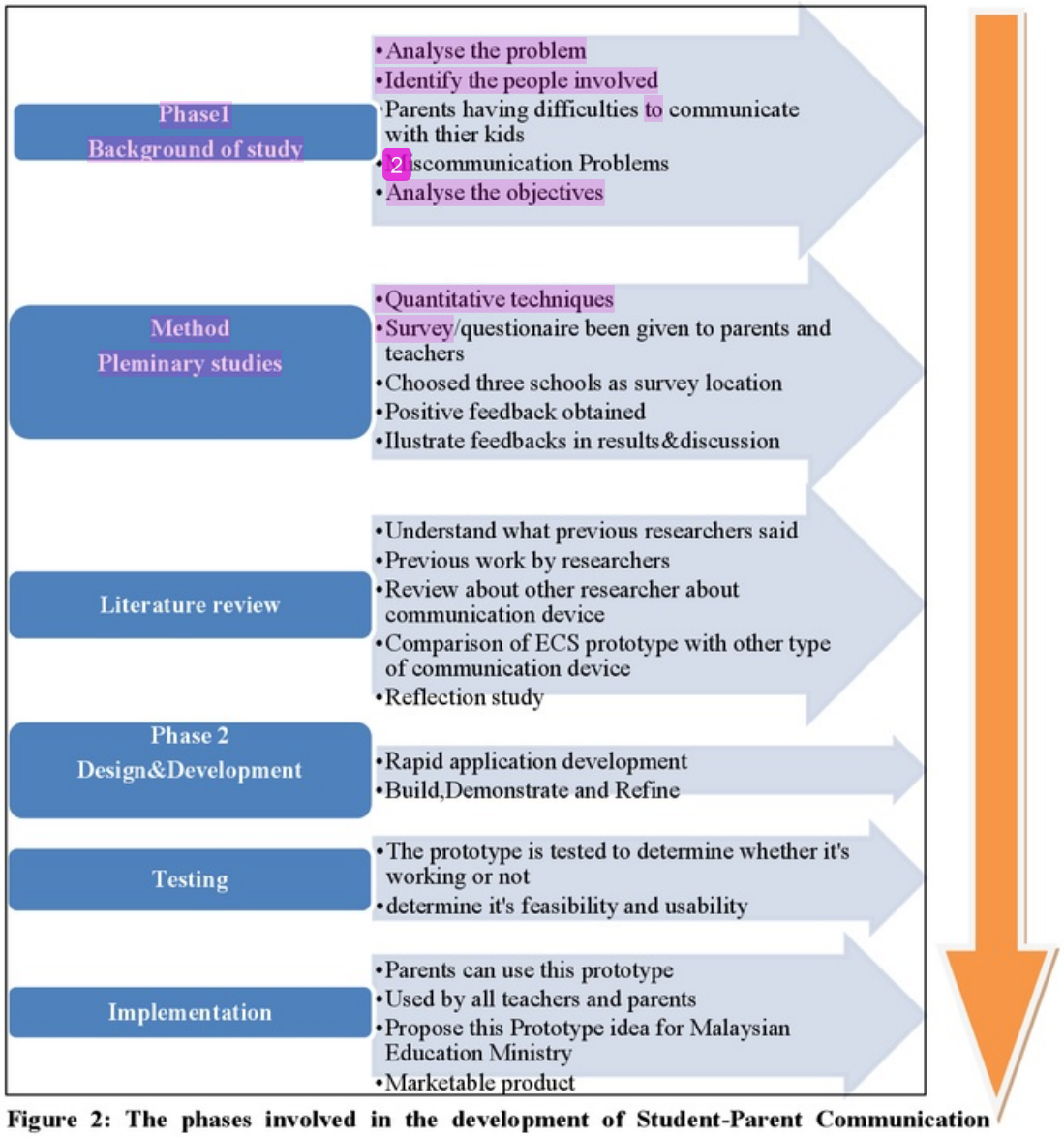



**Figure 2: The phases involved in the development of Student-Parent Communication System**

## 3.2 Phases, Process and Explanation

**Phase I**

### 3.2.1 Background Of Study

Nowadays, Malaysian parents having a big problem to communicate with their kids in the school. It seems that they have to get the teacher's phone number to contact them

and asked about their son/ daughter. Besides there is lot of due to this problem there is lot of miscommunication problems happens between kids and parents. In this case, although there are invention's such as hand phone, pager, Samsung Gear watch and etc. But still there is no any inventions properly design only for the purpose of communication between kids in the school and parents at home or office. So, Easy Communication System will be the solution for this problem. SPCS hardware prototype is a device whereby it is used only to contact and message parents that is busy in office or home.

### 3.2.2 Preliminary Study

In this preliminary study, the technique been used is quantitative analysis. In this study, four primary school were taken as the location for survey to be done that is Tenby International school, SK Tronoh, SJK (T) Tronoh and SK Sungai Petani. There were total of 50 respondents including teachers and parents filled the survey form. By Overall, SPCS hardware prototype initiative supported by many people and blaming this device should be used by the kids mainly to ease their daily communication with their parents. From the feedback, suitable tools and equipment to build SPCS prototype can be determined. Besides, sketch of the circuit diagrams and system architecture been sketched.

### 3.2.2 Literature Review

Literature review is the most vital ever part whereby this is the platform where all the research paper that is quite similar with this SPCS project is been compared to know its methods and deliverables. First of the foremost, the ideas from previous researchers on their previous work should be understood and compared to SPCS hardware prototype

research. From this, the tools and ways of implementing the research can be extracted for future enhancement. By the way, there is also reviews from other researchers about communication devices illustrating the methods and the types of communication devices existed in this globe. Lastly, reflection study of this SPCS hardware prototype explains the actions and techniques been used on their SPCS project. Besides, SPCS hardware prototype also reflected mainly in three context that is reflection on action, performance and reflection for action (forethoughts)

**Phase II**

### 3.2.4 Design and Development (Prototyping Cycles)

Designing and developing SPCS prototype will be another vital phase whereby in this phase people can see building development of the prototype from scratch. In this case, rapid application development model will be used upon the development of SPCS hardware prototype. Rapid application development involves for main stages that is Analysis and Quick Design, Prototyping Cycles, Testing, Implementation.

Build: Using the tools to build user interface and setting up the functions in the application. Connect the application to database that received and store these data that input by user.

Demonstrate: After finishing the first phase of prototype, the developer would present it to project supervisor for testing. Developer will explain briefly every component in the application to the supervisor is aware of each of the component functionality and identify any error in the prototype system process.

Refine: During system testing, the supervisor will provide feedbacks on how the application can be improved and developer will take the remarks.

### 3.2.5 Testing

After prototyping cycles complete, the complete application will be tested for its reliability in storing the accurate data in database, the components functionality, the

performance in terms of speed in responsiveness to selected parents acceptance testing to determine most likely will they find the either the prototype hardware is useful or not.

### 3.2.6 Implementation

Upon completion of testing phase and the result of the testing is good, the result of the testing is good, the application can be implemented in real server where every kids get to use the prototype.

## 3.3 Respondent Details


**Figure 3.3.1 Respondent Details**

Section 1 is about respondent demographic. Six questions were asked to capture the information on students details such as their gender, age, race, nationality, occupation and education their behaviour towards kids communicating device and recommender system later in this study. Respondent details are also taken to know the feedback of the parents towards Student parent Communication System prototype from their level of education background.

### 3.4 Respondent Opinion About Mobile Technology

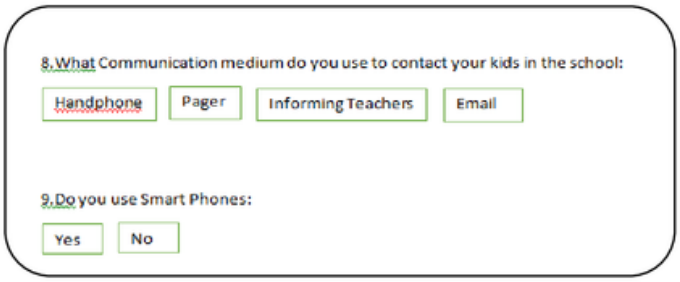



**Figure 3.4.1 Mobile Technology**

Section 2 consist of two questions is to get details on student's knowledge about mobile technology, in particularly the question asked how deep their knowledge about mobile technology is. The answer expected were to know their feedback about the traditional method used by the parents in communicating with the kids in the school.

## 3.5 Respondent Response About Awareness On SPCS Prototype

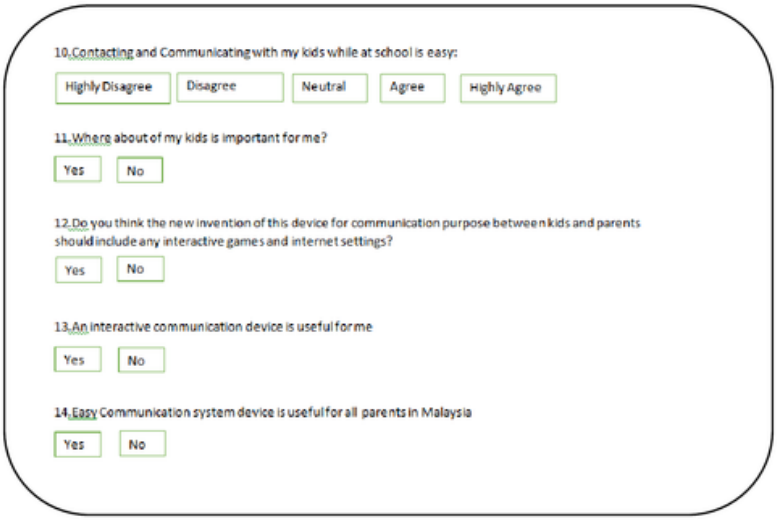



**Figure 3.5.1 Awareness On Recommender System**

Section 3 consist of five questions is to get respondent feedback on their awareness on recommender system. Since this study is focusing on communication between the kids in the school and parents is really important to know and evaluate the occurrence of other device similar with Easy communication system.

## 3.7 Tools For Development

### 3.7.1 Mplab Software


*Figure 3.7.1.1 MPLAB software used to program and burn PIC chip*

MPLAB IDE is a software program that runs on a pc (Windows, Mac OS, Linux) to Develop applications for microchip microcontrollers and digital signal controllers. It is called an integrated development environment (IDE), because it provides a single integrated environment to develop code for embedded microcontrollers. MPLAB software also will help to burn and program the programmable interface controller(PIC)on the PCB project board to let the prototype to work according to its programming coding. Normally, MPLAB software will help any programming coding. Normally, MPLAB software will help any programming coding such as Assembler Language and "C++" language. MPLAB IDE is a software program that runs on a pc (Windows, Mac OS, Linux) to develop applications for microchip microcontrollers and digital signal controllers. It is called an integrated development to be converted into hexa code, developer or user can define the meaning of the programming code through hexa code in a very easy way.

### 3.7.2 Google cloud platform


*Figure 3.7.2.1 Google cloud platform*

Google cloud platform is a web server where it use cloud computing to store, distribute, replicate and load balancing of data behind simple application programming interface (API).In order to store data in the application, the component in MPLAB software called Tinywebdb need to link with Google cloud platform that uses phyton in storing the data in database. As a developer, we can use this platform wisely to store all information and database regarding our database project.

### 3.7.3 Battery 12v


*Figure 3.7.3.1 Battery 12v*

Battery 12v is one of the vital part in SPCS hardware prototype because it will supply electrical energy towards the power supply to give power for the prototype to work. Normally, rechargeable 12v battery is the most suitable battery to be used Data communication & Networking project because it is so compatible to be used.

### 3.7.4 Programmable Interface Controller (PIC 16F877A)

*Figure 3.7.4.1 Programmable interface controller*

PIC microcontrollers (Programmable Interface Controller), are electronic circuits that can be programmed to carry out a vast range of tasks. PIC can be programmed to be timers or to control to a production line and much more. It is also found in most electronic devices such as alarm systems, computer control system, phones and etc. This PIC can be programmed and converted into hexa code by using MPLAB software. PIC microcontrollers are relatively cheap and can be bought as pre-built circuits or as kits that can be assembled by the user. The reason why PIC 16F877A is been used in SPCS prototype is because the built-in pins are less and just consisting 40 pins only whereby the functions will be simple, accurate and not complicated.

### 3.7.5 The Build-in Components And Part Of a Hand phone

*Figure 3.7.5.1 The Build In Components*

The built-in components of a hand phone is really important to be placed on SPCS prototype because the communication device needs template button to send message to the parents and some components such as memory unit and GSM driver been used.

### 3.7.6 Light Emitting Diode (LED)

*Figure 3.7.6.1 Light Emitting Diode*

LED usually been used in many electronic and IT prototypes. So, in SPCS prototype there will be three LED's will be connected to the PIC. It is been used to indicate the blinks of the connection when the power is on.

### 3.7.7 Power Supply (DC motor)

*Figure 3.7.7.1 Power supply*

23

DC motor is a very simple electric motor which is operated on direct current (DC). The DC motor moved due to the torque generated by the electro-magnetic field. DC motor will be responsible in giving power supply for the prototype to perform its task. The reason why DC motor have been choosed for SPCS hardware prototype because the cost is cheap and highly reliable.

### 3.7.8 Buzzer

*Figure 3.7.8.1 Buzzer*

A buzzer is an audio signalling device whereby it transform electrical energy into sound energy. Buzzer application system is interconnected with DC motor application. It requires a DC voltage to operate, it should generally be between 3v and 28v, depending on the model. A buzzer designed to operate at 6v generally works very well for any supply voltage between 4v and 8v, and a buzzer designed to operate at 12v can work perfectly at a voltage between 6V and 28V.

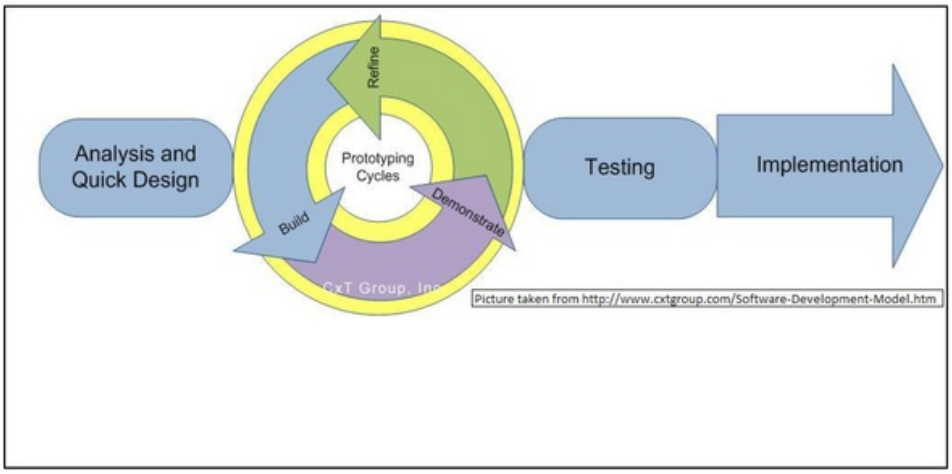
**Table 3.8 Key Milestone**

| Key Milestones | Week 1 |
|---|---|
| Project Title Proposal | Week 2 |
| Documenting Interim Report | Week 3 |
| Submitting Interim Report | Week 12 |
| Proposal Defense | Week 13 |
| Development & Prototyping | Week 14 |
| User testing & Acceptance | Week 23 |
| Documentation Interim Report | Week 24 |
| Pre Sedex | Week 26 |
| Viva | Week 27 |
| Submission Interim Report Hardbound | Week 29 |

### 3.9 Gantt Chart

| Deliverable Name/Task Name | Week | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| **1. Planning Phase**<br>-Preliminary Research Work<br>-Identify Problem statement<br>-Define Objectives<br>-Define Scope Of Study<br>-Literature review on subject matters | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| **2. Analysis Phase**<br>-Data collection<br>-Prepare questionnaire<br>-Distribute questionnaires | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| **3. Analysis Phase**<br>**Analysis of Project**<br>-Determine function/non-functional of system<br>-Verify changes and prioritize requirement<br>-Determine tools for development & designing | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| **Last preparation of report** | | | | | | | | | | | | | | |
| **Submission of Interim Report** | | | | | | | | | | | | | | |
| **Proposal Defence** | | | | | | | | | | | | | | |

### 3.10 Rapid Application Development

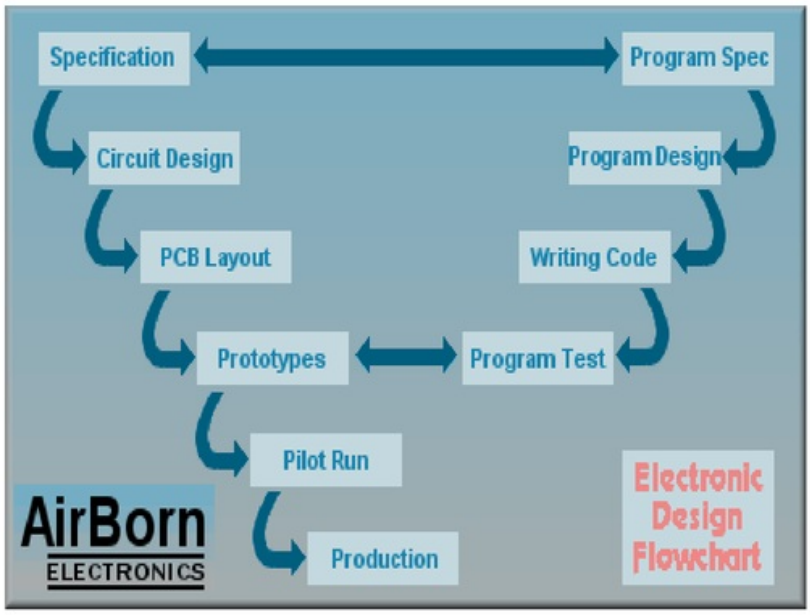



16

**Figure 3.10.1 Rapid Application Development diagram**

"Rapid Application Development (RAD) is a development lifecycle that is designed to give faster development and higher-quality results than those achieved with the traditional lifecycle. It is designed to take the maximum advantage of powerful development software that has evolved recently" (James Martin, 1980). RAD method would be the suitable method used in conducting this study given the duration of time with duration less than nine months to come up with a prototyping. Besides that, RAD is preferred in using rapid prototyping where developer presents the initial prototype to user to test the hardware system. One of the advantages of RAD firstly is the time consuming in planning is much shorter compared to traditional method like waterfall model which required longer time in collecting and obtaining requirements and also by using this method would help in managing the project budget as the proper way will be done in the same application without having to develop another prototype cater the improvement.

## 3.11 Electronic design Process Flowchart




**Specification**

The specification is the customer's instructions to the designer describing the features the new product should have.

**Program Spec**

Program specification is really vital to determine which type of components, tools and type of programming coding is been used in this prototype.

**Circuit Design**

The circuit diagram, also called as the schematic or logic diagram, maps out the electronics and connections in the most readily readable form

**Program Design**

Program design is the fundamental sketch or drawing of a project of the prototype. It will illustrate all the specification and also the position of the components.

**PCB Layout**

The connections between the components in the PCB layout match the connections in the PCB layout match the connections on the circuit diagram, and are physically placed and routed by the designer to obtain the best result. The PCB layout defines the final physical form of the circuit, and enclosure and labelling details can be finalized as the layout is completed.

**Writing Code**

Writing code is one of the hardest parts because we need to program the coding according to the preference of the prototype to function.

**Prototypes**

Prototype is one of the end product of your project whereby it is completed by using all the hardware knowledge that I have. The prototype circuitry is usually debugged in stages. The debugging proceeds according to the debug test procedure. Well this is the last phase and product for my final year project.

# CHAPTER 4

## RESULTS AND DISCUSSION

### 4.1 Results Of The Preliminary Study

On the preliminary basis, this survey has been categorized into three main categories of schools that is rural area school, middle end school and International school. For rural area school SJK (T) Tronoh in Perak was selected as the location for the survey whereby having the chance to get the feedback from the parents and teachers about Easy Communication system project. The feedback was overwhelming and positive. Hence, for the middle end school that been choosed SK Sungai Petani that is located in Sungai Petani, Kedah. Most of the parents of the kids seriously happy and interested with Easy Communication System hardware prototype project. The third school was Tenby International School in Meru Raya, Perak. Most of the parents over there came from well-educated background and rich. So, their perception have been analyzed too and the feedback was very good until some parents were so eager in asking many questions about Student Parent Communication System prototype. In addition, survey also have been done with the residents around Bandar Seri Iskandar about SPCS hardware prototype. By Overall, Student Parent Communication System research project have won a lot of people's heart.

**I)Gender**

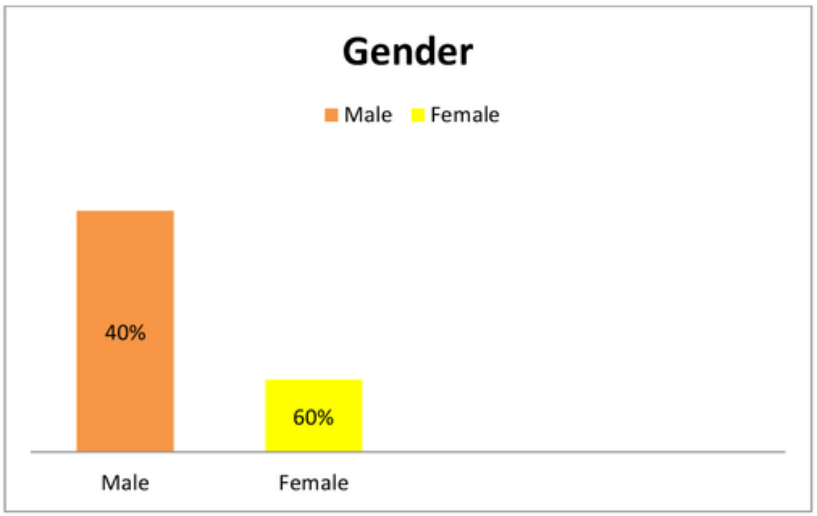



**Figure 4.1.1 Gender statistics**

The respondents to the survey in the three selected primary school and resident's around Bandar Seri Iskandar was consisting of 20 male respondents that is 40% and 30 female respondents that is 60%.

**II) Age**

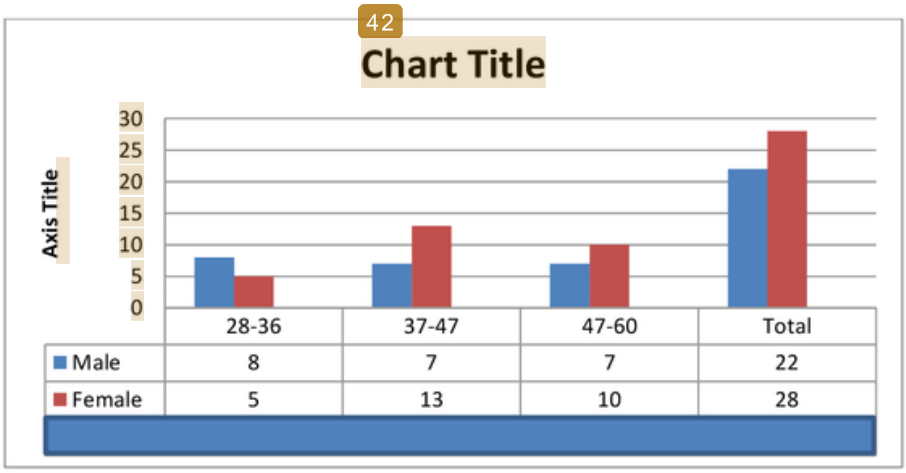



**Figure 4.1.2 Age statistics**

The age range of respondents including parents and teachers will be 28 to 60 years old. In this case, there will be 8 male respondents and 5 female respondents from the age range of 28-36 years. The percentage of the respondents aged from 28-36 years old stated 26%. Hence, 7 males and 13 female information of survey is collected from the respondents range age of 37-47 years old. The percentage obtained by the research is 40%. Besides, 7 males and 10 female respondents were selected for the age range of 47-60 years old. In this case, the percentage obtained is 34 %. By overall research, respondents aged from 37-47 showed the highest percentage responded on the SPCS survey.

**iii) Race**

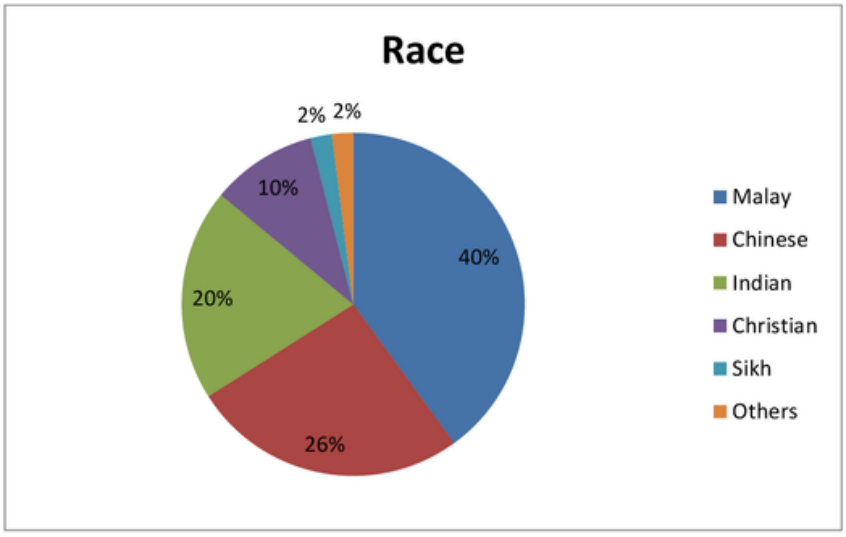



**Figure 4.1.3 Race statistics**

In my questionnaire survey journey, the survey was concentrated towards 1 Malaysia people whereby all type of races was the respondents throughout the survey. In this case, there were 20 Malay people that is 40%, 13 Chinese people that is 26%, 10 Indian people that is 20%, 5 Christian people that is 10%, 1 Sikh people and 1 Siamese people that is 2%. So, they were the valuable respondents to fill in the questionnaire form.

**iv) Education Background Of Parents**

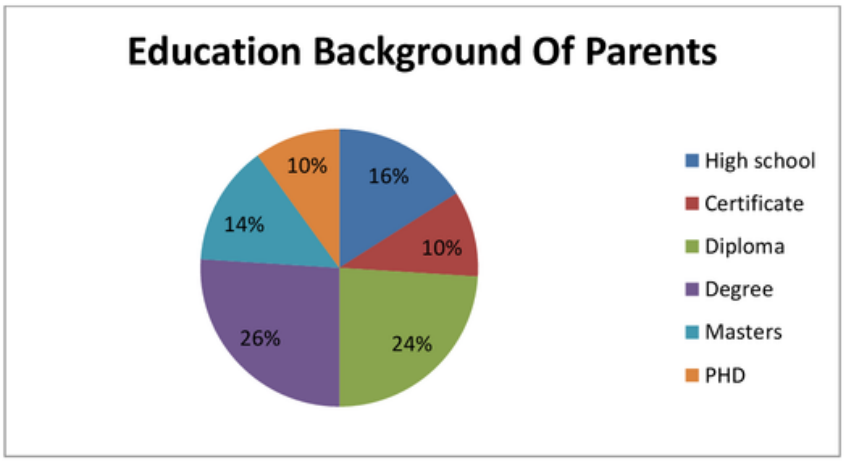



**Figure 4.1.4 Education Background Of Parents statistics**

Therefore, based on the survey above are the details of the education background of the respondents that spend their time on my survey. Basically, this survey form have branched out into five main qualifications that is High School, Diploma, Degree, Masters and PhD. Basically, degree holders among parents shows the highest amount that is 26% and PhD shows the lowest amount by 5 of them that is 10%. By overall research, the parent of the kids is seriously from the background of well-educated and knew about advancement of technology nowadays. This education background study is done to know the level of the parent's mentality on how they are concern about the security of the kids in the school.

**V) What Type Of School Of The Kids Are Studying**

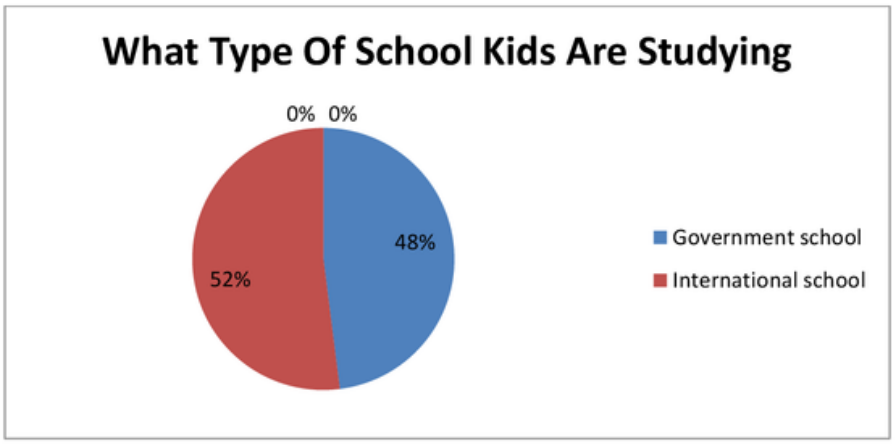



**Figure 4.1.5 What Type Of School Kids Are Studying statistics**

Basically, the respondents of parents from International school stated the highest that is 26 parents by the percentage of 52% and 24 from government school that is 48%. This difference is really vital to know the perceptions from two strong entities to be contributed into my SPCS research project. From my observation, parents from international school tend to ask me many questions and they were really eager for the output of my SPCS hardware prototype. Besides, Government school parents having the imbalance of view because they came from various education backgrounds. Most of them understand about my initiative and few others still having doubts on the feasibility of SPCS hardware prototype.

**VI) What Communication Medium Do Parents Use To Contact Their Kids In The School**

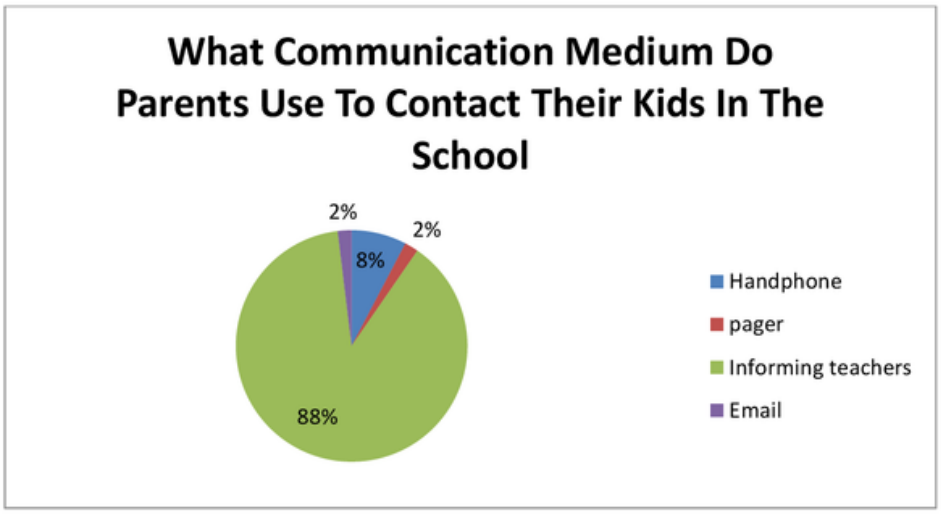



**Figure 4.1.6 What Communication Medium Been Used statistics**

Based on my findings on what communication medium mostly used by parents to communicate with their kids in the school will be Informing teachers that is 46 respondents that is 88% saying the same medium been used to reach the kids in the school. So, this clearly shows that all the respondents having some problem to reach their kids while they are in the school and they are in the need of having any device that is specially made to communicate with their kids only in their respected school. At the same time, if this informing teachers option continuous it will affect the productivity of the performance of the school if the school teachers busy entertaining the kids parents. So, to avoid this kind of problems, SPCS hardware prototype will be the solution.

**VII) Do You Use Smart Phones?**

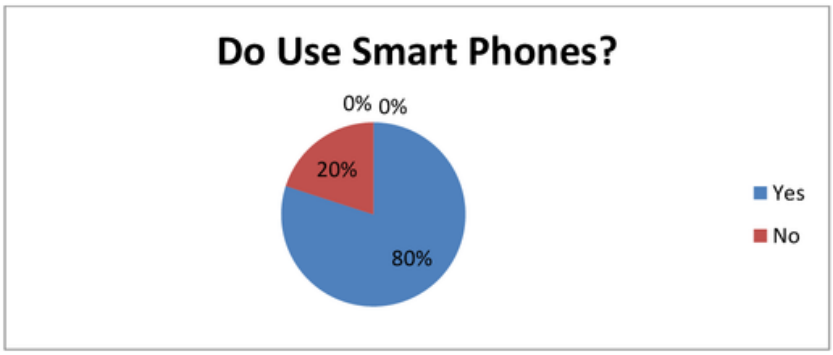



**Figure 4.1.7 Do You Use Smart Phone statistics**

In this case, pie chart above is been used to illustrate the number of smart phone user. Well, 40 of the respondents were indulged with smart phone usage and only 10 of them are not using smart phone but using normal GSM phone. Anyway, this question frontline is only to know the amount of smart phone users around this country but it doesn't matter for my hardware prototype because all type of phones can be used to communicate with SPCS prototype.

**VIII) Contacting And Communicating With My Kids In The School Is Easy**

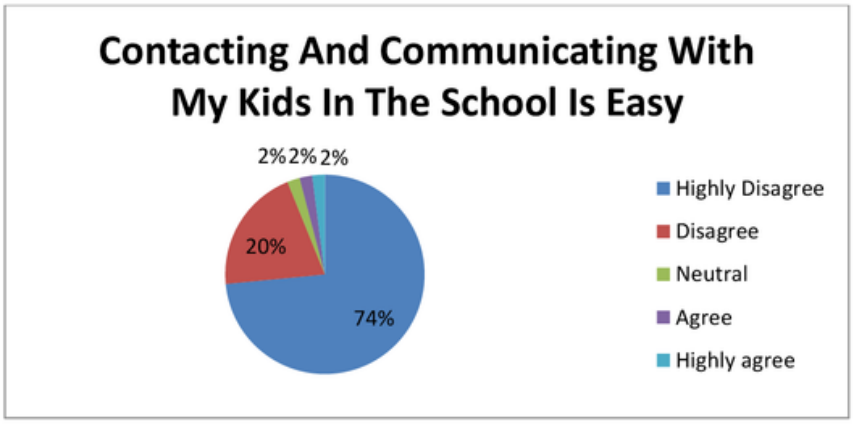



**Figure 4.1.8 Contacting And Communicating with Kids statistics**

Based on the pie chart above, it shows that many of the parents highly disagreeing for the problem involving contacting and communicating with the kids in the school is easy by the percentage score is 74%. It's really hard and causing troublesome for the parents to reach their kids while they are in the school. They really in need of any device or prototype to let them to communicate with their kids told by few respondents that filled my questionnaire form.

**X) Where about My Kids Is Important For The Parents**

When a lot of survey questions been asked there were always imbalance of answers by respondents but for this question that is about the security of the kids is important for the parents and by overall, all the respondents said they are really worried of the where about of their kids. 100% was achieved by the response stated by the respondents. Nowadays, a lot of bad phenomena is happening in Malaysia including child kidnapping and using children for bad purpose. So, parents tend to be worried about the where about of their kids. SPCS hardware prototype will be the best to cool most of the parents fear about the safety being of their kids.

**XI) Do You Think The New Invention Of This Device For Communication Purpose Between Kids And Parents Should Include Any Interactive Games And Internet Settings?**

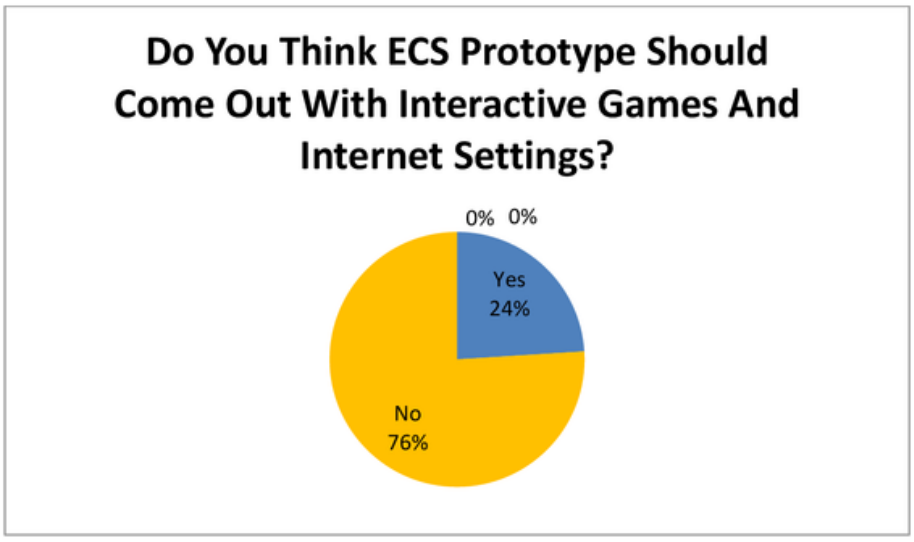



**Figure 4.1.9 Do You Think SPCS Prototype Should Come Out With Interactive games statistics**

Most of the parents showing their concern and gratitude towards the kids education and safety by not supporting for any interactive games and internet settings on the SPCS prototype because it seems that, this kind of entertainment stuffs would degrade the level of studies of their kids. There were 76% respondents disagreeing with interactive games and internet settings and 24% supported the idea of interactive games and internet settings should be included in SPCS prototype. Based on the parents view, having interactive games and internet settings will seriously disrupt the consistency of the kids in studies. They tend to use the SPCS prototype for other purpose sychronisingly against the objective of SPCS prototype.

**XII) Easy Communication System Is Useful For All Parents in Malaysia**

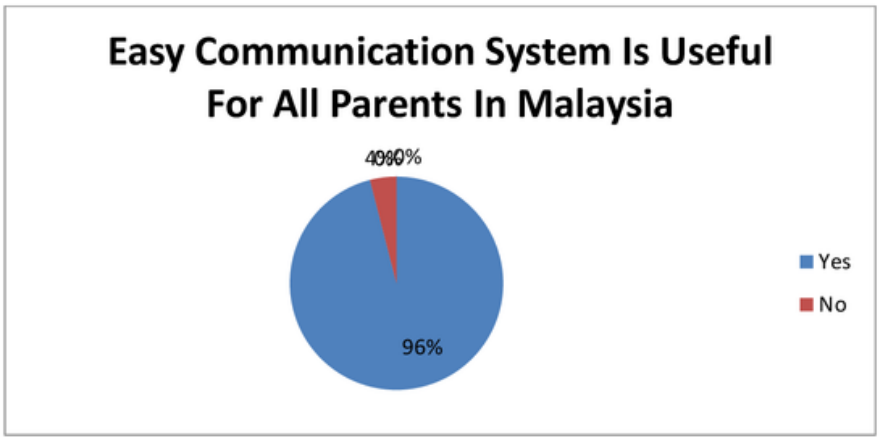



**Figure 4.1.10 Easy Communication System Is Useful for All Parents in Malaysia statistics**

Lastly, based on my final survey question that is my hardware SPCS prototype would it be beneficial to all the parents in Malaysia. The feedback that I got for this question is seriously positive because 98% that is 48 respondents supporting towards my initiative and saying that my idea going to be a very good idea for the parents, kids, Kementerian Pelajaran Malaysia, teachers and school. In this case, it seriously going to be a huge boom for the nation and the parents because Student Parent Communication System is one of the pioneer and the first to be invented specially made for kids from school to communicate with their parents at home or office.

## 4.2 User Acceptance Testing

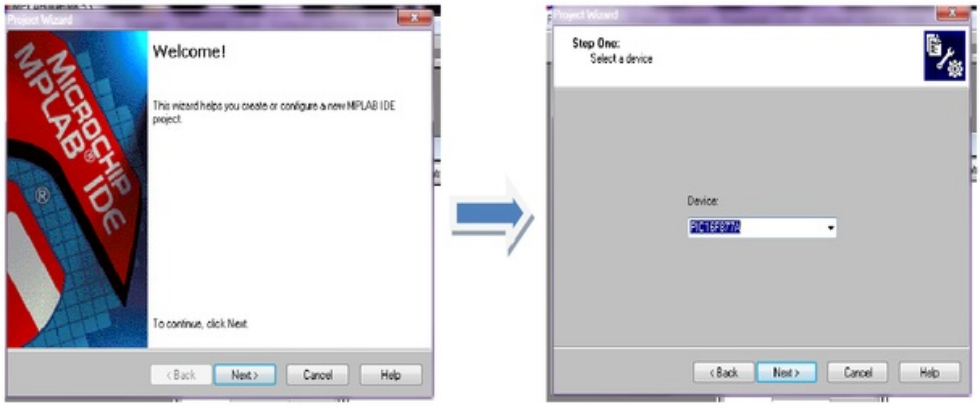
**Result: Phase 2**

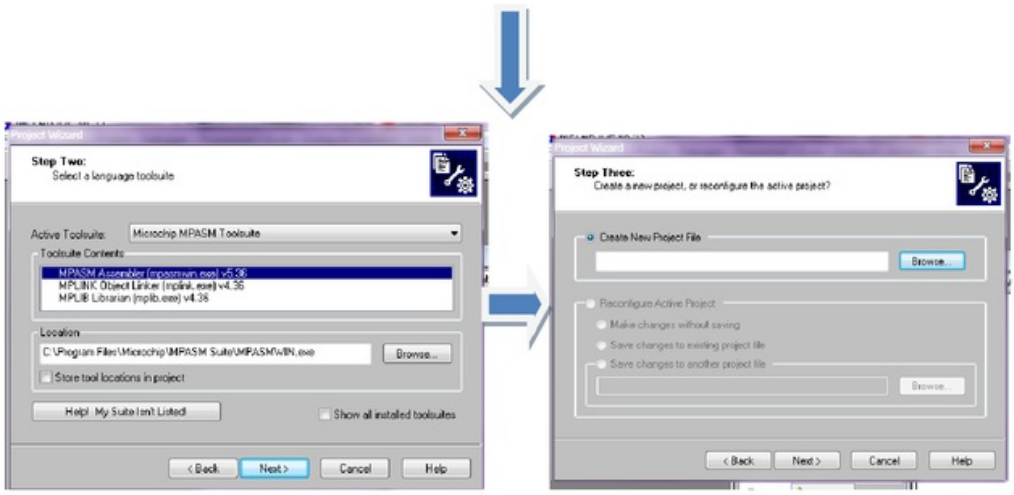
For Final year Project 2, full prototype of Easy Communication System was completed and successful in operating it task. Hence, the programming language used will be Assembler Language and it will be successfully build and compiled in MPLAB software. Besides, User Acceptance Testing also was done in SJKT Tronoh to know the acceptance of SPCS prototype for the kids in the school.

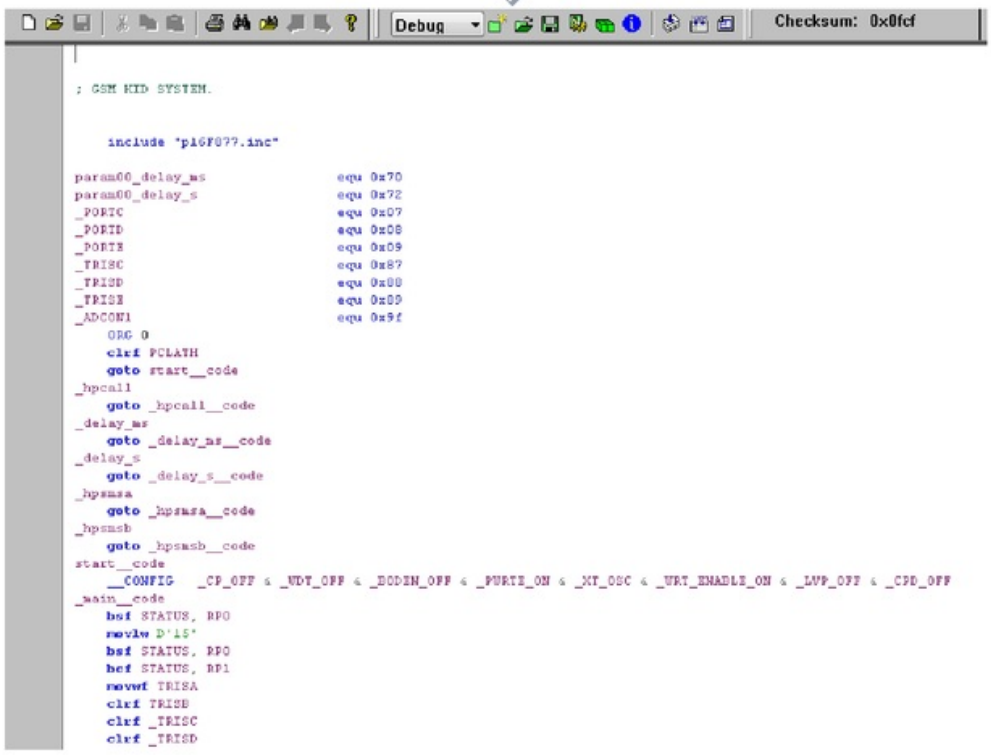
**SPCS Full Prototype**

**Figure 4.2 :ECS Full Prototype**

**2.The Compiling procedure from Assembler Language to Hexa Code through MPLAB Software**




Project Wizard
Step Two:
Select a language toolsuite
Active Toolsuite:
Microchip MPASM Toolsuite
Toolsuite Contents:
MPASM Assembler (mpasmwin.exe) v5.36
MPLINK Object Linker (mplink.exe) v4.36
MPLIB Librarian (mplib.exe) v4.36
Location:
C:\Program Files\Microchip\MPASM Suite\MPASMWIN.exe
Browse...
Store tool locations in project
Help! My Suite Isn't Listed!
Show all installed toolsuites
< Back
Next >
Cancel
Help
Project Wizard
Step Three:
Create a new project, or reconfigure the active project?
Create New Project File
Browse...
Reconfigure Active Project
Make changes without saving
Save changes to existing project file
Save changes to another project file
Browse...
< Back
Next >
Cancel
Help


Debug
Checksum: 0x0fcf
; GSM KID SYSTEM.
include "p16F877.inc"
param00_delay_ms equ 0x70
param00_delay_s equ 0x72
_PORTC equ 0x07
_PORTD equ 0x08
_PORTE equ 0x09
_TRISC equ 0x87
_TRISD equ 0x88
_TRISE equ 0x89
_ADCON1 equ 0x9f
ORG 0
clrf PCLATH
goto start__code
_hpcall
goto _hpcall__code
_delay_ms
goto _delay_ms__code
_delay_s
goto _delay_s__code
_hpsmsa
goto _hpsmsa__code
_hpsmsb
goto _hpsmsb__code
start__code
__CONFIG _CP_OFF & _WDT_OFF & _BODEN_OFF & _PWRTE_ON & _XT_OSC & _WRT_ENABLE_ON & _LVP_OFF & _CPD_OFF
_main__code
bsf STATUS, RP0
movlw D'15'
bsf STATUS, RP0
bsf STATUS, RP1
movwf TRISA
clrf TRISB
clrf _TRISC
clrf _TRISD

**3.The Calling and Messaging Process In SPCS Prototype**

**Figure 4.2.1 The Calling And Messaging Process In SPCS Prototype**

**4. User Acceptance Testing In SJKT Tronoh**

**Figure 4.2.2: User Acceptance Testing**

Based on that pictures, User Acceptance Testing process were done in SJKT Tronoh involving 4 primary school kids. The process goes as follows:

1. Introduction of SPCS Prototype to the school kids
2. Teaching Them the method to handle the prototype.

3. Demonstration of the prototype been tested to get the output and feedback

**5.SPCS Full System Architecture**

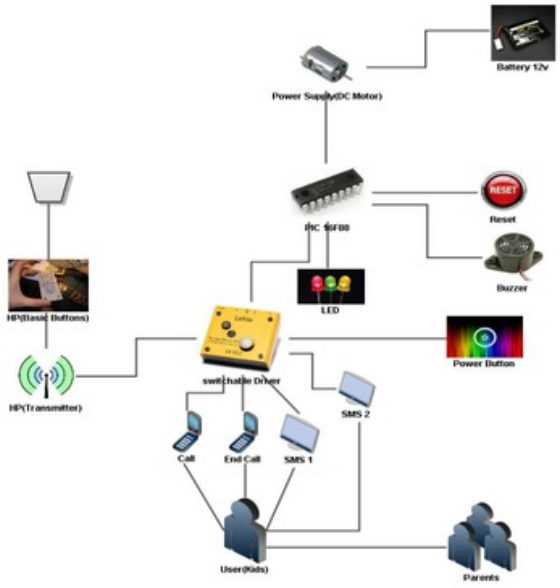



**Figure 4.2.3: SPCS System Architetecture**

**6.Internal Circuit Design Architecture(Autocad Drawing)**

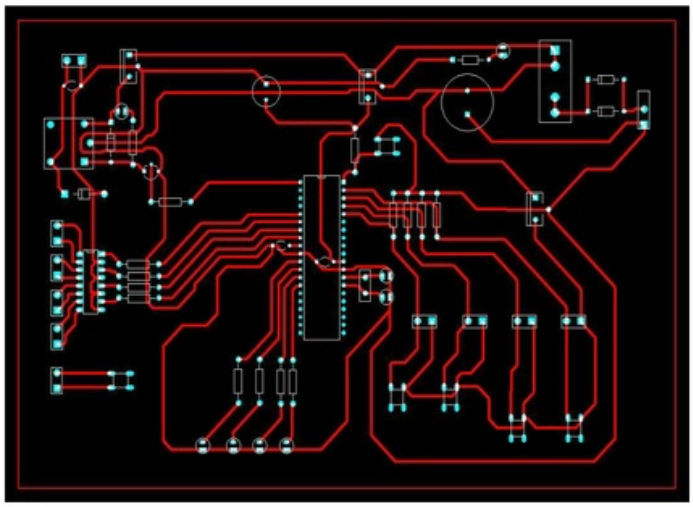


**Figure 4.2.4: SPCS Internal Circuit Design**

## 4.3 Results And Data Collected Based On The Interview With The Teachers And Students

**I) What Do You Think about SPCS prototype?**

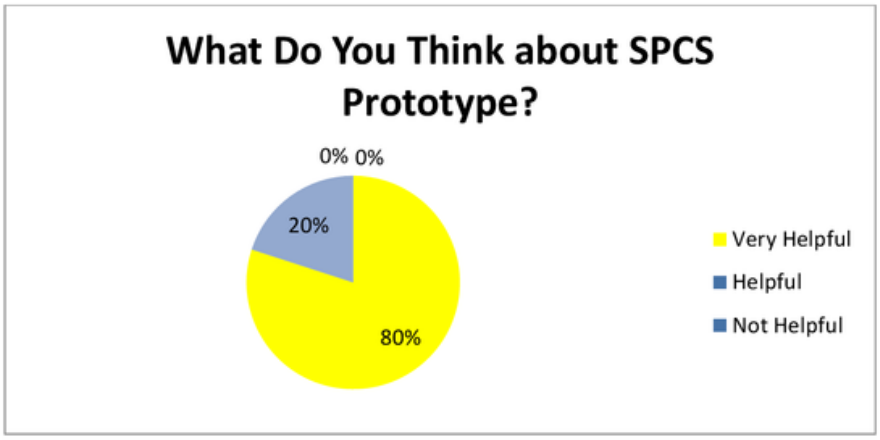



**Figure 4.3 What Do You Think about SPCS prototype Statistics**

On July 7, my FYP acceptance testing is done and tested in SJKT Tronoh. Therefore, 8 respondents including 4 teachers and 4 students were interviewed through the testing procedures. 6 of them that is 80% voted for very helpful for the primary school students and 2 of them said it is helpful for the students. Based on the testing, none of them represent any negative feedback on this prototype. The kids were so happy and delighted with the prototype because it seems it can help to reduce the fear and worry in their parents by letting them to know the latest update about their where about.

**II) Number of Kids accepted the idea of SPCS prototype**

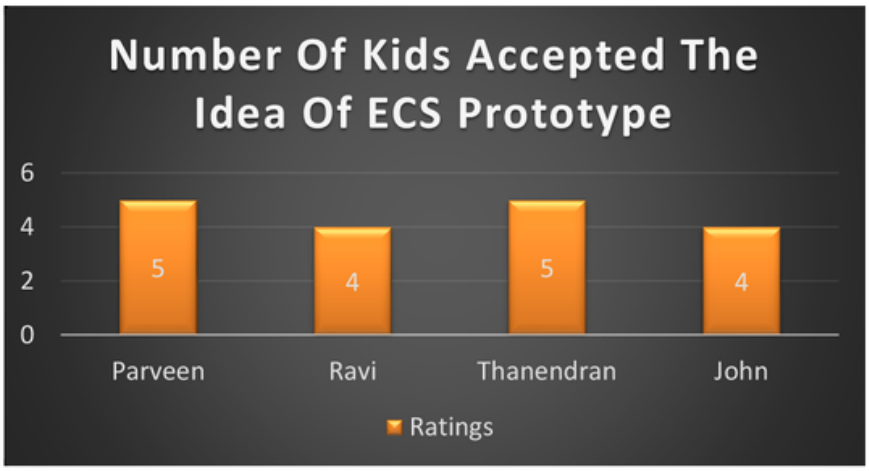



**Figure 4.2.1: Number of Kids accepted the idea of ECS prototype Statistics**

Next Interview question will be the Number Of Kids Accepted The Idea Of SPCS Prototype. There were 4 kids were selected for the question and the answer recorded as follows. The ratings were done upon X/5. Based on the result obtained 2 of them voted for 4/5 and 2 of them voted 5/5 for the ECS prototype. In addition, extravaganza feedback was obtained from the kids and more feedback improvement has been recorded based on the conversation with the kids.

**III) Number of Kids accepted the idea of SPCS prototype**

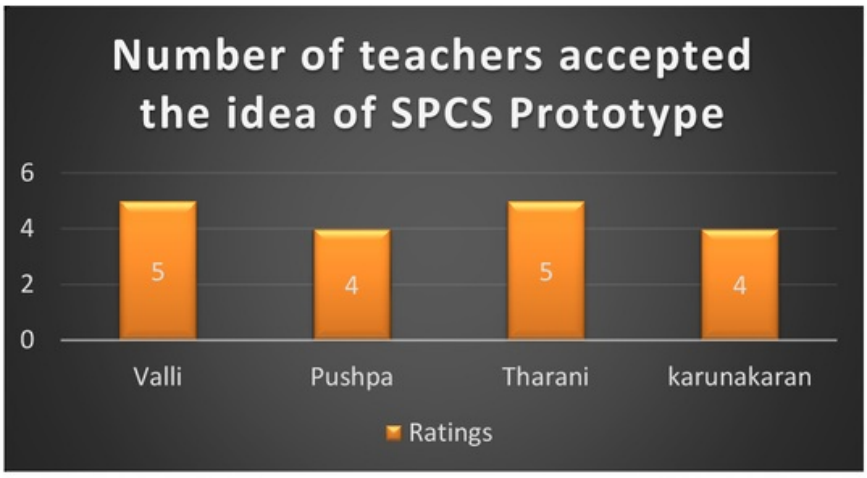



**Figure 4.3.1: Number of Kids accepted the idea of ECS prototype Statistics**

Next Interview question will be the Number of Teachers Accepted the Idea of SPCS Prototype. There were 4 teachers were selected for the question and the answer recorded as follows. The ratings were done upon X/5. Based on the result obtained 2 of them voted for 4/5 and 2 of them voted 5/5 for the ECS prototype. Besides, the teachers were so satisfied with SPCS prototype because there is no distraction element in SPCS.

**IV) Do You Think SPCS should be commercialized?**

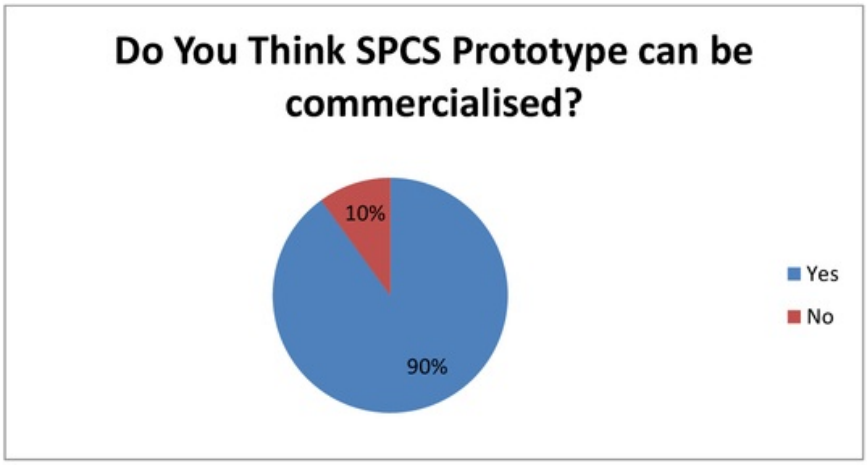



**Figure 4.3.2: Feedback of SPCS Prototype commercialisation statistics**

The idea of commerliasation of this SPCS prototype was in me since the idea was created. So, The feedback that I got for this question is seriously positive because 90% that is 7 respondents supported the idea this product should be commercialized throughout this country and only 10% people only voted for SPCS should not be commercialized. I was really contented to get such positive feedback on my project and few ideas been given by the teachers such as proposing SPCS to the Kementerian Pelajaran Malaysia to make it to be used by all primary school students in Malaysia.

**V) ECS Is Feasible And Convenient To Be Used?**

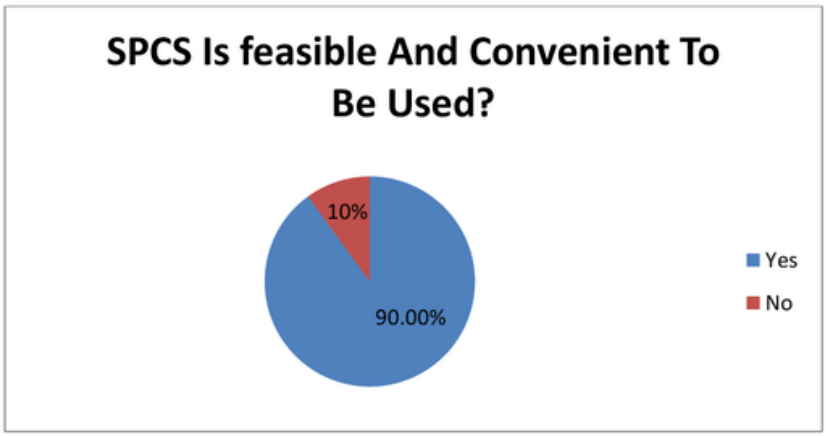



**Figure 4.3.4:The feasibility of ECS usage results**

SPCS Prototype is always friendly towards their user. Lastly, feasibility of SPCS usage been shout out to the teachers and students. The feedback obtained was really good and positive. Based on the result, 90% of respondents voted for feasible and convenient to be used and 10% respondents voted for not feasible and convenient. By this, SPCS prototype proven to be one of the user friendly product to be for the users and going to be very helpful for the parents and teachers in the future.

## 4.2 System architecture

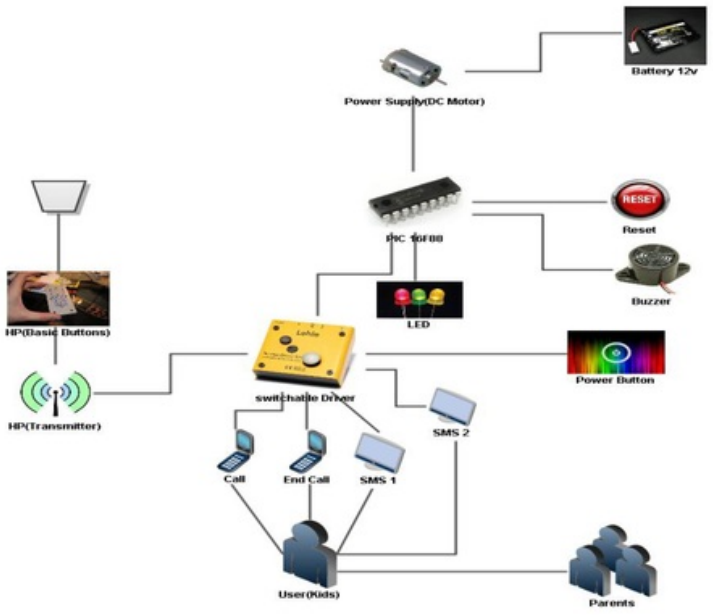



**Figure 4.2.1 System Architecture For SPCS hardware Prototype**

The system architecture starts with Programmable interface controller (PIC 16XXX) used to be as the backbone for this Easy communication hardware project. PIC is programmed using Assembler Language and then been compiled using MPLAB software to be converted as the hexa code. Well that is for programming part. By the way, for technical part a scratch HP components been used as the main platform to be connected with the PIC. First of all, the basic button from scratch HP is connected to HP(Transmitter) to transmit signal to PIC and to make PIC to send back signal to confirm that input signal is there. Besides that, power supply 12v-16v been used to provide power supply to the PIC and to the entire prototype to make the prototype to function properly. The power supply also connected to the 12v battery to provide power for the prototype to function. This prototype been allocated with its own charging hub to charge its prototype once the power has diminished. There is Reset butt if on to set again the functional of the prototype if anything happens. For example, lagging. Lastly, the most vital button in the prototype will be the functional button driver

whereby it has five important buttons that is call, end call, SMS1, SMS2 and power Hp. This buttons controls and navigate the activities performed by the system architecture starts with Programmable interface controller (PIC 16XXX) used to be as the backbone for this Student parent communication hardware project.PIC is programmed using Assembler language and then been compiled using MPLAB software to be converted as the hexa code. Well that is for programming part. By the way, for technical part a scratch HP components been used as the main platform to be connected with the PIC. First of all, the basic button from scratch HP is connected to HP (Transmitter) to transmit signal to PIC and to make PIC to send back signal to confirm that input signal is there. Besides that, power supply 12v-16v been used to provide power supply to the PIC and to the entire prototype to make the prototype to function properly. The power supply also connected to the 12v battery to provide power for the prototype to function.

This prototype been allocated with its own charging hub to charge its prototype once the power has diminished. There is Reset button if on to set again the functional of the prototype if anything happens. For example, lagging. Lastly, the most vital button in the prototype will be the functional button driver whereby it has five important button that is call, end call, SMS1, SMS2 and power Hp. This buttons controls and navigate the activities performed by the kids. Therefore, Fixed template messages is used to send message to the parents and for calling there is no problem because this prototype allow user that is kids to call the parents covering almost all the places in Malaysia without any boundaries. Fixed template messages is used to send message to the parents and for calling there is no problem because this prototype allow user that is kids to call the parents covering almost all the places in Malaysia without any boundaries.

### 4.3 Activity diagram ( Swimlane diagram for SPCS calling flow between parents and kids)

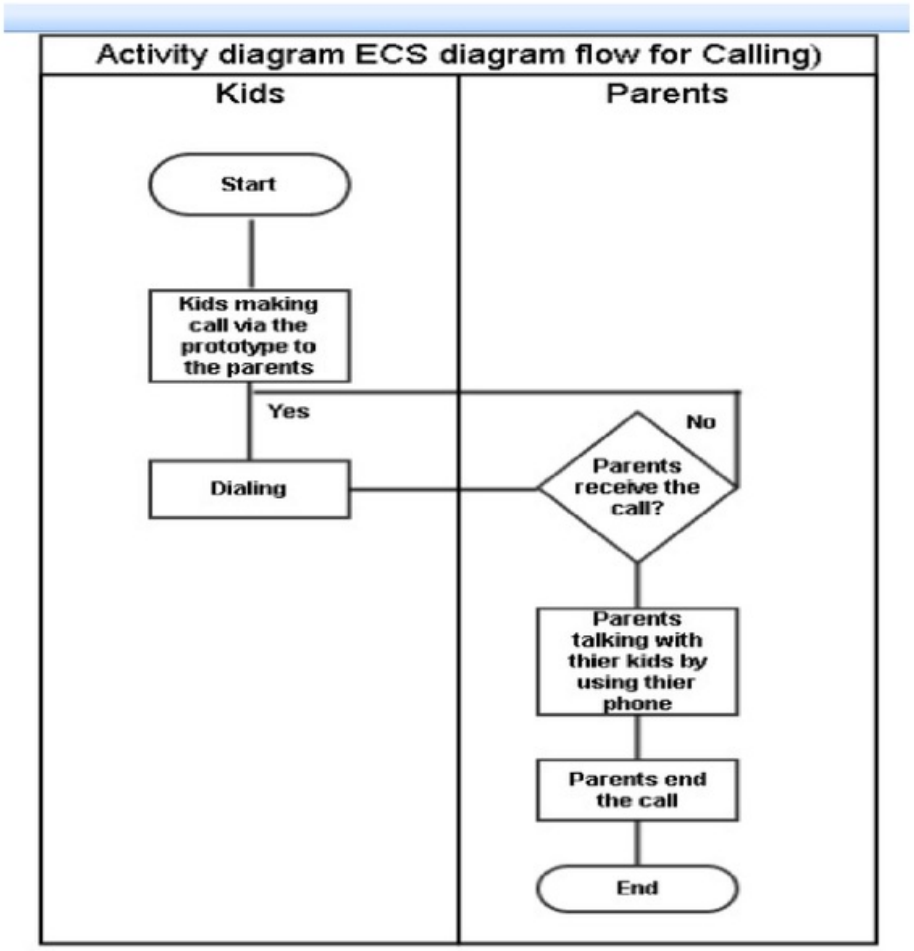



**Figure 4.3.1 Swim lane diagram for SPCS prototype calling flow**

i) Activity Diagram (Swimlane Diagram) for SPCS prototype calling flow starts from the kids in the school. They will make a call for their parents, directed towards Parents hand phone. Hence, Parents receive the call and start their conversation with their kids. After the kids conveying the important message parents will end the call.

## 4.4 Activity diagram (Swimlane diagram for SPCS messaging flow between parents and kids)

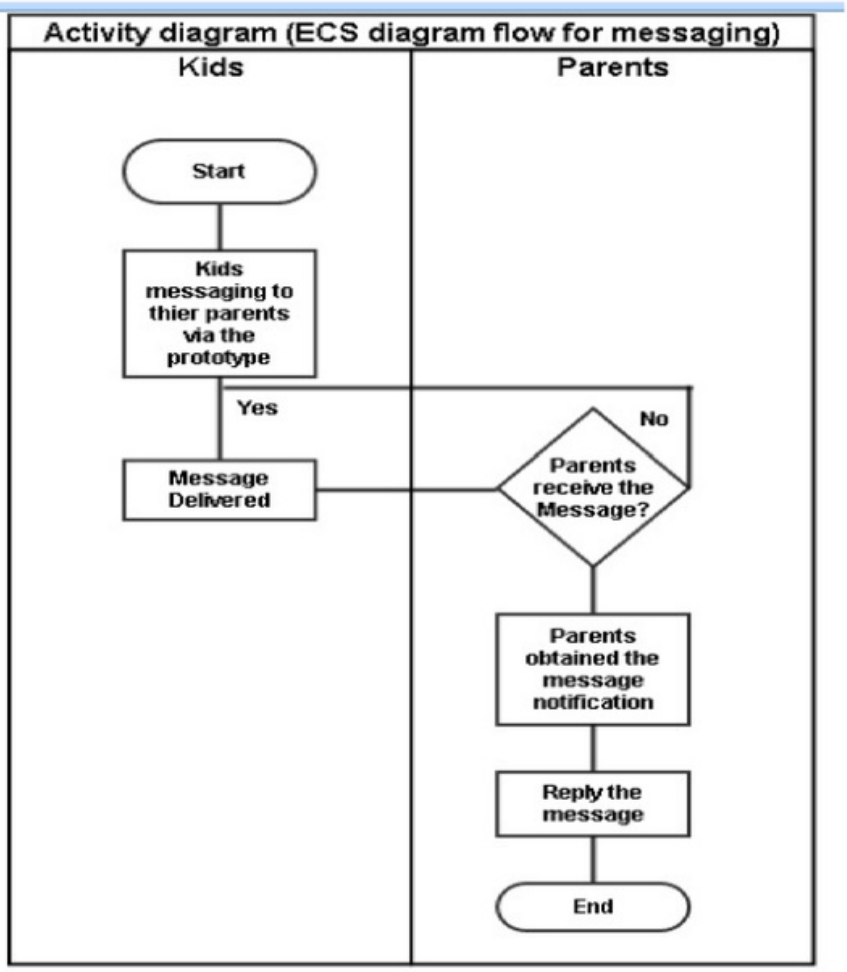



**Figure 4.4.1 Swimlane diagram for SPCS prototype messaging flow**

ii) This activity diagram (Swimlane diagram) for SPCS Prototype Messaging Flow started by the kids messaging any templates messages such "Daddy Please pick me up at 3pm or "mummy, please Call me back. After finish typing the message, the message will be delivered to parents hand phone. Within few seconds, Parents will receive notification message from their kids. In this case, Parents will read the message and reply the message to their kids.

### 4.5 UML Diagram

**Use-case Diagram for parents and kids to communicate each other**

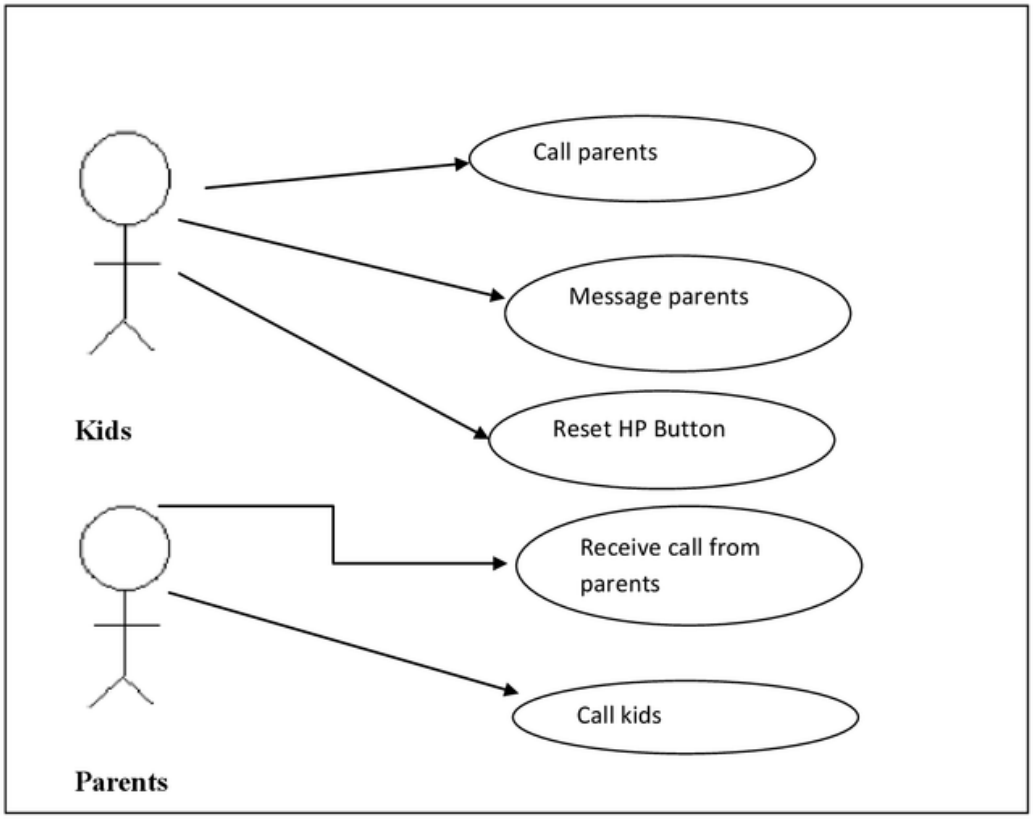



**Figure 4.5.1 Use case diagram for parents and kids in ECS hardware prototype**

iii) In this ECS research prototype project Use Case diagram also playing an important role. For Instance, in this use case diagram there are two actors that is Parents and Kids. Kids will be accomplishing three main tasks that is calling their parents, messaging their parents and reset the HP button on the prototype if the system lag. By the way, for parents there will be two main activities will be carried out by them that is receiving call from parents and calling their kids to know their condition.

# CHAPTER 5

## CONCLUSION

As conclusion, after gathering vital information by similarizing and comparing the information by some researchers from previous publications and journals that is quite similar with this SPCS prototype project. I have got the ideas, theory and practical application about the do able of Easy Communication system by going through to all the publications. Although, there are some information that is not related but yet still have used a part of the usable information to convert into explicit knowledge for the Interim report. Besides that, Methodology part have played vital role too by giving me the exposure and techniques of the process flow of data collection and data gathering through survey. In this case, system architecture also been illustrated to make everyone understand more about the flow of the circuits and functions of the Easy Communication system hardware prototype. In addition, Methodology part in report played vital role in explaining the steps and deliverables through Rapid application method. This method is been used to illustrate the steps involved that is quick analysis and design next will be build, demonstrate and refine. Next, will be the testing phase. This phase is seriously vital to test FYP prototype whether it is working or not. Last but not least will be the implementation phase that is to make end users to use the prototype and show the prototype is working. By the way, another supporting proof for FYP interim report will be results and discussion part whereby in this part tabulation of all the output and result that been obtained through my survey by preparing a questionnaire for the respondents involving parents and teachers in the school. All the information were illustrated in pie chart and bar chart form for better enhancement and to show in a clear way the proof of information that have obtained. By Overall, all the respondents have given good feedback and supporting feedback towards SPCS prototype project because it's seem to be very helpful for the parents at home or office and the kids in the school. This is because, nowadays advancement of technology playing a vital role but it should be in a

good way same as this SPCS prototype, it is applying Data communication and networking knowledge, Electronics and Information technology field but the project has certain limitations that is made according to the suitability of the school kids.

## 5.1 Recommendations For Future Enhancement

For every final year project, there should be future better enhancement on how to make a prototype or research of a project to be more efficient and appropriate to be used in the future according to the updated enhancement of latest technology. Therefore there are few list of recommendation for future enhancement:

A) Use temperature sensor to detect the lifetime of charging and to overcome over heating caused by the charging activities by the prototype

B) For now, the message template is fixed, in the future I hope alternative digital template is inserted to change the message template that is been sent to parents by kids.

C) Use arduino chip as a replacement for programmable interface controller (PIC) as the backbone for the prototype.

D) Enhance the technology of the prototype by allowing conference call involving both parents with the kids.

## References


1) Yang, S. (2006). Analysis On the Prospects Of Parent Adolescent Communication Served By Mobile Technology. *Resources Service Architecture and Key Technology Study On Ubiquitous study*.

2) Rogers, R.H., & Wright, H.V. Assessing Technology's Role in Communication between Parents and Middle Schools. *Electronic Journal For The Integration Of Technology In Education, Vol (7),* 36-58.

3) Bailey, L.R., Stoner, B.J., Parette, P.H., Angell, E.M. (2006). AAC team perceptions: Augmentative and Alternative Communication Device Use. *Education And Training In Development Disabilities, Vol 4(2),* 139-154.

4) Grunwald Associates LLC, (2013). Living And Learning With Mobile Devices For Early Childhood And K-12 Learning.

5) Indico, H.M., Lanciso, M.L., Vargas, L.A. (2014, January ). Mobile Monitoring And Inquiry System Using Fingerprint Biometrics And SMS Technology. International journal of Scientific And Research Publication. Vol 4 (Issue 1), 1-6.

6) Imhmed, A.M. (2009) Parent Alert System (PAS) Via SMS. Universiti Utara Malaysia Information Technology Department. 1-58.

7) Mindshift, (2013, April 26). Kids And Adults: How To Avert Communication Breakdown. Retrieved from http://ww2.kqed.org/mindshift/2013/04/26/kids-and-adults-how-to-avert-communication-breakdown/

8) Teah. S.K.J., Cheok, D.A., Peiris,L.R., Choi, Y., Thuong, V., Lai,S. (2008, July 11). Huggy Pajama: A Mobile Parent And Child Hugging Communication System. *ICN 2008-Papers,* 250-257

9) Sheldon, S. B. (2007). Improving Student Attendance With School, Family, And Community Partnerships, Journal Of Educational Research, 100(5), 267-275

10) Shneiderman, B. (1980). Software Psychology : Human Factors In Computer And Information Systems: Winthrop Publishers.

11) Epstein, J. L. (2001). School, family, and community partnerships: Preparing educators and improving schools. Boulder, CO: West view.

12) Epstein, J. L. (2005). Attainable goals? The spirit and letter of the No Child Left Behind Act on parental involvement. Sociology of Education, 78, 179-182.

13) Constantine, 2003; Hoover-Dempsey, Walker, Sandler, Whetsel, Green, Wilkins & Closson, 2005.Why Do Parents Become Involved? Research Findings And Implications. The Elementary school Journal, 106, 2.

14) Gollakota, (2013). Discussing Benefits Of Interference In Wireless Network. Retrieved from http://www.interferencetechnology.com/mit-graduate-honored-for-work-discussing-benefits-of-interference-in-wireless-systems/

15) Yousif Ahmed, Zeinab Abd Alrahman, Razan Saad Aldeen, Elham Altyeib and Khansaa Taha. (2013). Designing of an Embedded Software System for Patient's Tele-Monitoring using SMS. *3rd International Conference on Intelligent Computational Systems (ICICS'2013)*.

16) Sujithra M. and Padmavathi G. (2012). Mobile Device Security: A Survey on Mobile Device Threats, Vulnerabilities and their Defensive Mechanism. *International Journal of Computer Applications (0975-8887) Volume 56-No.14*.

17) Ofcom, (2014). Children And Parents: Media use And Attributess Report. Retrieved from http://stakeholders.ofcom.org.uk/binaries/research/media-literacy/media-use-attitudes-14/Childrens_2014_Report.pdf

18) Suzie, B. (2014). Edutopia: Home To School Connection Guide. Retrieved from http://www.bostonpublicschools.org/cms/lib07/MA01906464/Centricity/Domain/112/home_schoolcommunication_guide.pdf

19) Star Online,. (2014, June 2). School Phone Ban Retained. Retrieved from http://www.thestar.com.my/news/nation/2012/10/04/school-phone-ban-retained/

20) Borneo Post Online,. (2012, July 28). Body: Use Of Mobile Phones In Schools Has More negative Than Positive Effects. Retrieved from http://www.theborneopost.com/2012/07/28/body-use-of-mobile-phones-in-schools-has-more-negative-than-positive-effects/

## Appendices

### i)The example of Questionnaire form

***A)Hereby I am Siva Kumaaran S/O Arumugam final year student from UniversitiTeknologiPetronas would like to do a survey on my final year project.Currently I'm working on my project entitle Easy Communication System that will allow primary school students to communicate with their parents at home or office by implementing a device or gadget to be used by the primary school students.I'm doing this project to ease the daily life of parents that so worried of their kids security and safetyness.***

***B)You can either Tick or circle for each answer options and thanks for spending your pleasurest time on this questionnaire:***

1.Gender:

| M | F |
|---|---|

2.Age:

| |
|---|

3.Race:

| Malay | Chinese | Indian | Kristian | Sikh | Others |
|---|---|---|---|---|---|

4.Nationality:

| Malaysian | Non Malaysian |
|---|---|

5.Occupation:

| |
|---|

6.Education background:

| High school | Certificate | Diploma | Bachelors Degree | Masters | PHD |
|---|---|---|---|---|---|

7.What type of school your kids are studying:

| International School | Government School |
|---|---|

8. What Communication medium do you use to contact your kids in the school:

Handphone | Pager | Informing Teachers | Email

9. Do you use Smart Phones:

Yes | No

10. Contacting and Communicating with my kids while at school is easy:

Highly Disagree | Disagree | Neutral | Agree | Highly Agree

11. Where about of my kids is important for me?

Yes | No

12. Do you think the new invention of this device for communication purpose between kids and parents should include any interactive games and internet settings?

Yes | No

13. An interactive communication device is useful for me

Yes | No

14. Easy Communication system device is useful for all parents in Malaysia

Yes | No

**2) Survey And Questionnaire Journey**

**i) The first place I went to do my survey ( Sk Tronoh)**


**ii) Waiting for The Feedback From En. Ali And The Team**

**iii) Heavy discussion between The Top Management Team of SK Tronoh About ECS Research Prototype.**

**iv) All of them are discussing about ECS questionnaire**

**V) The second Location(SJK (T) Tronoh)**


**Vi) SJK (T) Tronoh Administration Office**

**Vii) SJK(T) Tronoh Headmaster Being One Of The Respondent In My Survey**

# FYP DISSERTATION

ORIGINALITY REPORT

| 26% | 22% | 6% | 15% |
|---|---|---|---|
| SIMILARITY INDEX | INTERNET SOURCES | PUBLICATIONS | STUDENT PAPERS |

PRIMARY SOURCES

| | | |
|---|---|---|
| 1 | www.ijsrp.org<br>Internet Source | 4% |
| 2 | Submitted to Universiti Teknologi Petronas<br>Student Paper | 3% |
| 3 | www.corp.att.com<br>Internet Source | 2% |
| 4 | etd.uum.edu.my<br>Internet Source | 2% |
| 5 | www.vschool.net.cn<br>Internet Source | 2% |
| 6 | ejite.isu.edu<br>Internet Source | 1% |
| 7 | airccse.org<br>Internet Source | 1% |
| 8 | Submitted to Texas A&M University - Commerce<br>Student Paper | 1% |
| 9 | airborn.net.au | |

| | | |
|---|---|---|
| | Internet Source | 1% |
| 10 | www.aninews.in<br>Internet Source | 1% |
| 11 | tienanh.info<br>Internet Source | 1% |
| 12 | Submitted to BATANGAS STATE UNIVERSITY<br>Student Paper | 1% |
| 13 | research.ijcaonline.org<br>Internet Source | 1% |
| 14 | kindalame.com<br>Internet Source | <1% |
| 15 | Submitted to Universiti Teknikal Malaysia Melaka<br>Student Paper | <1% |
| 16 | Submitted to University of Greenwich<br>Student Paper | <1% |
| 17 | Submitted to William Carey University<br>Student Paper | <1% |
| 18 | James Keng SoonAdrian DavidRoshan L.YongsoonVuongSha TehCheokPeirisChoiThuongLai. "Huggy Pajama", Proceedings of the 7th international conference on Interaction design and children - | <1% |

| | | |
|---|---|---|
| | IDC 08 IDC 08, 2008<br>Publication | |
| 19 | Rose, Bess A., and Marc L. Stein. "Mechanisms for Teacher Outreach to Parents in Charter and Traditional Public Schools", Journal of School Choice, 2014.<br>Publication | <1% |
| 20 | Submitted to Dhofar Univesity<br>Student Paper | <1% |
| 21 | Submitted to Taylor's Education Group<br>Student Paper | <1% |
| 22 | Submitted to University of Sunderland<br>Student Paper | <1% |
| 23 | www.innovateus.net<br>Internet Source | <1% |
| 24 | Submitted to Higher Ed Holdings<br>Student Paper | <1% |
| 25 | Submitted to University of New South Wales<br>Student Paper | <1% |
| 26 | www.theborneopost.com<br>Internet Source | <1% |
| 27 | ijaiem.org<br>Internet Source | <1% |
| 28 | Submitted to University of Newcastle<br>Student Paper | <1% |

| | | |
|---|---|---|
| 29 | Submitted to University of Northampton<br>Student Paper | <1% |
| 30 | Submitted to American Intercontinental University Online<br>Student Paper | <1% |
| 31 | Submitted to CSU, Fullerton<br>Student Paper | <1% |
| 32 | Submitted to Universiti Sains Malaysia<br>Student Paper | <1% |
| 33 | Submitted to Edith Cowan University<br>Student Paper | <1% |
| 34 | www.ruicom.cn<br>Internet Source | <1% |
| 35 | airborn.com.au<br>Internet Source | <1% |
| 36 | h18000.www1.hp.com<br>Internet Source | <1% |
| 37 | Submitted to KMD Computer Center<br>Student Paper | <1% |
| 38 | Submitted to University of Central England in Birmingham<br>Student Paper | <1% |
| 39 | www.interferencetechnology.com<br>Internet Source | <1% |

| | | |
|---|---|---|
| 40 | Submitted to Higher Education Commission Pakistan<br>Student Paper | <1% |
| 41 | tobink8.org<br>Internet Source | <1% |
| 42 | legacy.bluegrass.kctcs.edu<br>Internet Source | <1% |
| 43 | ep3.uum.edu.my<br>Internet Source | <1% |
| 44 | en.wikipedia.org<br>Internet Source | <1% |
| 45 | utpedia.utp.edu.my<br>Internet Source | <1% |
| 46 | www.ncbi.nlm.nih.gov<br>Internet Source | <1% |

| | | | |
|---|---|---|---|
| EXCLUDE QUOTES | OFF | EXCLUDE MATCHES | OFF |
| EXCLUDE BIBLIOGRAPHY | OFF | | |